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PIERRE A. FISH, Editor **ITHACA, N. Y.**

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THE DUTY THAT LIES NEAREST

The duty that lies nearest is not always the most agreeable. Duty is the art of doing what one ought to do rather than what he wishes to do. Sometimes the two harmonize, more often they do not. In time of war duty, as a paramount issue, is written large. The love of one's country stands on a par with love for one's family. The country represents a large, composite family and one who fights or lays down his life for it, does it for his own as well as for the families of others. Greater love than this can no man possess.

Many are prone to accept the protection and benefits of our country without a serious sense of obligation, in much the same way that a child accepts the protection and care of its parents—as a matter of course. In time of need the obligation must not be ignored. The freedom for which our ancestors fought and bled has become inherent in us, we accept it as a matter of right. When it is threatened we would be unworthy of their supreme sacrifice if we permit it to have been made in vain, if we cannot endure what they have endured, if we cannot maintain what has been gained and transmit the torch of liberty, undiminished in its luster, to our progeny.

In our present need the obligation is being met. Veterinarians are as keenly alive to it as others. Because of delayed recog-

nition and organization, as compared with sister professions, some delay in efficiency may be expected. Much of the burden of the future must rest upon the veterinary reserve corps because the personnel will greatly outnumber the regular army veterinarians. Many of the reserve veterinarians have gone into the service at considerable personal sacrifice and this but exemplifies and intensifies their loyalty. Those not enlisting may show their loyalty, and many have, by taking care of the practices of their enlisted colleagues until their return. It is needless to enumerate the sacrifices, but the underlying idea, the duty that lies nearest, is that the future of this country must be made safe for liberty for all who live in it.

War is a drain upon all of the resources of a country. Some localities may be denuded of veterinary service. There may be a shortage of veterinarians in the army, if the war continues a couple of years longer as has been predicted. It has been reported that some of our allies, after three years in the field, are in need of more veterinarians. With an increasing number of animals to see the war through, without a corresponding increase of veterinarians, there can be only one result: inadequate attention and an increase of animal suffering. To insure a forthcoming or reserve supply of veterinarians it would appear wise to make some provision for veterinary students subject to the draft whereby their course may be finished before being drawn into service. It should be easier to fill places in the ranks where only a physical examination is the chief requirement, than to fill the places in the veterinary service where a special and technical training is necessary. Other things being equal, a young man who has already entered this course of special training should be of more service to his country after his course has been completed, than to serve in the ranks where, with his acquired knowledge, there is no opportunity for the application of it.

The veterinary advisory board has made efforts to have drafted veterinary students furloughed—not exempted—in order that they may complete their course. This action, it is said, has been taken in the case of medical students. Medicine is divisible into the human and veterinary branches and it would appear just that medical and veterinary students, since both branches are of service to the government, should have the same rating. At this

writing we have no definite information that any action has been taken, except that the decision is to be made by President Wilson.

The duty that now lies nearest is service. Action is service. Preparation for action, if it will make the action more efficient, is service. Many cannot contribute actively but they may contribute to the welfare of those who have suffered from active service. Some of our professional brothers among the allies have lost all they possessed. Some of our own veterinarians may suffer grave losses before the war is over. One of the grandest things the American Veterinary Medical Association ever did was the adoption of President Cotton's suggestion to establish a relief fund for the allied veterinarians, and the generous response made at the recent meeting of this association, argues well for the future. All can serve in such a worthy cause; the duty lies very near. Such a contribution blesseth him that gives as well as him that receives.

P. A. F.

AN ANTITOXIC SERUM FOR FORAGE POISONING

Forage poisoning is a term, which has served to conceal much ignorance. Efforts to place it on a rational and scientific basis and to separate it from various pseudo-forms are highly commendable.

Dr. Robert Graham and his co-workers have devoted themselves, in recent years, to the study of forage poisoning in horses. As a result of their labors they have lately announced the isolation of an anaerobic bacillus which morphologically, culturally and serologically is similar to *B. botulinus,* the organism of meat poisoning. Leonard Pearson in 1901 was apparently the first to call attention to the analogy of forage poisoning in domesticated animals to botulism (meat poisoning) in man. Corroborative evidence was delayed until 1916 when Buckley and Shippen with a strain of *B. botulinus* induced in horses and mules, fatal results with some symptoms of forage poisoning. Graham has found that the clinical symptoms accompanying artificial *B. botulinus* infection in horses and mules closely resembled the symptoms and lesions recognized in natural outbreaks of forage poisoning in Central Kentucky.

An antitoxic serum, prepared against *B. botulinus* in the goat, sheep and cow, proved efficacious against lethal amounts of an homologous toxin in horses and mules when they received the antitoxic serum intravenously and subcutaneously. Protection against

the anaerobic organism, which Dr. Graham had isolated, was also established. Further investigations are promised.

The demonstration of the action of this serum is of timely interest. Further research and confirmation by others are important and necessary. The results will determine the value of the investigations which, thus far, seem hopeful of advancing our knowledge.

P. A. F.

EUROPEAN CHRONICLES

Bois Jerome.

In my last chronicle, in the summary of the contents and bibliographic notes, I made allusion to two papers presented by veterinarians at the meetings following the *Congress Hippique* in 1914.

Under the jurisdiction of the Secretary of Agriculture, this national society, which has for its object the improvement, protection and elevation of horse breeding, holds yearly a meeting which is somewhat similar to the great horse show in New York and which is followed by a congress, where papers, reports and discussions take place during the three days that it is held. It is from this, that I extract the two following communications among several that were presented by veterinarians. As will be seen, both of these papers have great importance in referring to the condition of the health of horses, and especially those used for breeding purposes.

Stallion-Carriers of Infectious Germs.—This is the subject treated by Prof. H. Vallée, the well known director of the Alfort school.

Designated under the above name are the subjects, which in appearance have recovered from an infectious disease and conserve in their organism, in a dangerous form, the microbian germs from which they have suffered.

It can be understood that these subjects give off the microbes they have, spreading disease and contagion, while living among their victims. They remain immune, vaccinated by their original infection.

The notion of germ carriers has no less interest in veterinary medicine than in human and for two infectious diseases of horses it is of essential importance.

These two diseases are typhoid fever and infectious anemia. Both are due to microbes of a specific type and so small that they are not visible to the microscope and pass through the filtering bougies which hold the microbian germs of ordinary type.

Typhoid Fever.—Already in 1825, with Benard, the propagation of typhoid fever, whose intimate nature was then unknown, is mentioned, as observed in a mare covered by stallions recovered from the disease.

Other analogous facts were observed but the disastrous influence of the recovered stallion was positively established only in 1884 by Deglaire.

The history of one of these stallions is striking. Affected in September 1881, he rapidly recovered from his sickness. He covered mares in January 1882 and infected the country where he was. When the season for covering mares was over, the disease disappeared, but it returned two years later when another stallion brought it back and for two years insured the contamination of all the mares he served.

From the proof given by Deglaire, and supported by others, the notion of the germ carriers was well established and important investigations were made in all countries.

Poels demonstrates the virulency of the sperm of a stallion cured of typhoid fever. Reeser and Bemelman show that the intravenous inoculation of the sperm of a recovered stallion produces the disease. Bemelman considers the virus is held in the vesicula seminalis, an opinion which is confirmed by the experiments of Gallandet-Huet who found specific living germs in the vesicula seminalis of animals recovered from rouget, anthrax fever or infection of streptococcus, of strangles. Bergmann has finally demonstrated that the contents of the vesicula and the prostatic secretions kept their virulency in one infected stallion for at least seven years.

Infectious Anemia.—It is by the work of Carré and Vallée that in 1906-7 the nature of this affection was completed.

The first question of importance to answer is this: in the strict sense of the word, do horses recover from typho-anemia, infectious anemia?

The answer of these investigators is *No.* And although germ carriers, the stallions that have recovered from typhoid fever have all the appearances and attributes of health, the ones considered as

recovered from anemia are in our estimation most often only "white washed". (*Blanchis.*)

During long researches, still unfinished, these authors have put on record cases of apparent recoveries, which might be believed definite, if the subjects had not been submitted to a long and rigorous control. Such an individual which, in appearance recovered and offered none of the signs of disease revealed himself, however, always infected. Its urine, albuminous still, is virulent and its blood is capable of infecting a new horse in which it is inoculated.

"White washed" (*Blanchis*) subjects spread the contagion and have a perfect inaptitude to reinfection. Six liters of virulent blood inoculated in one of them failed to promote the slightest trouble.

This inaptitude to reinfection, as long as the disease remains in a latent form, is not a quality of the organism of the horse carrier of anemic germs. It is observed in almost all the chronic infections, piroplasmosis, spirillosis and in syphilis. At any rate it can be thought that once cured, no immunity is left behind the disease and that it is still susceptible of revival.

At the present time, it is not possible to give the exact duration of the virulency of the excretions of "white washed" anemic individuals. It is known that it can last for years and that every animal, recently bought, ought in that respect to be the subject of special attention. The urine of such an animal ought to be examined and the quantity of albumin it contains determined. In the most improved, the best recovered in appearance, it is exceptional for the urine not to contain a more or less abundant quantity of albumin. Although this may not be a criterion of positive or real value, it is rather essential.

WILLIAMS' OPERATION. Major veterinarian Dr. Fontaine of the military school of Saumur has presented the second paper to which I desire to call the attention of our readers.

After a few words of introduction to his subject, the doctor gives a summary description of the anatomy, physiology and pathology of the region and enters into the description of the operation—dorsal decubitus for the patient, general anesthesia not necessary, local is sufficient with cocaine, adrenalin or novococaine, the larnyx is easily entered after division of the crico-thyroid ligament.

The ventricular membrane is removed by any of the numerous methods which have been proposed. The after care is simple; return to work ought to be as late as possible, about two and a half months.

And now, the doctor comes to the consideration of a double operation. Opinions are divided. The left vocal cord is in the great majority of cases the only one which is paralyzed and he removes only the mucosa of that side. From his observations the subjects most relieved were those in which the unilateral operation had been performed. The cases where the two ventricles were operated upon were only improved.

The double operation can only give good results when *both cords are paralyzed* and those cases are exceptional.

Out of 100 operated, Fontaine gives statistics of 66 cures, 33 improved and one failure.

These recoveries or improvements are considered as lasting. A hard and heavy service has been performed by them for three years.

To close his communication, Dr. Fontaine examines the questions which are brought forward by the possible recovery of the chronic roarer. 1st the warranty in case of sale of an animal which had been operated. 2nd the factor of heredity and the part of infection resulting from chronic roaring.

In proposing the discussion the following questions are advanced: 1st must reproduction be forbidden to the roarer (stallion or mare)?

2nd shall a stallion operated successfully by Williams' operation be allowed to serve mares? 3rd can a mare cured by the operation be allowed to reproduce?

As final conclusions Fontaine says: 1st The surgical treatment for chronic roaring of horses can be realized with advantage and must be tried.

2nd Williams' operation is the treatment of choice.

3rd Working horses operated and recovered can be considered as sound and sold as such.

AUTO-STERILIZATION OF WOUNDS.—This has been the subject of a very interesting communication from Dr. Le Grand before the Societe de Chirurgie and from which I find a brief account in the *Presse Medicale.*

After having mentioned how much a very infected wound

sterilizes itself as soon as it is free from all necrosed tissues, the doctor related the observation of auto-sterilization made on wounds completely sutured after resection of all the necrosed tissues.

Twenty-four hours after the suture, he takes by aspiration one drop of the serum between the edges of the wound and examines it. He renews his examination with each dressing of the wound.

The first of these, made twenty-four hours after the suture, have the same characters from the point of view of the cells—an abundance of intact polynuclears. From the point of view of microbes they differ some times in quite a large number. Those most frequently in the primitive sutures, were the specimens of perfringens, in some cases free or partly or totally phagocyted.

This period of strong local polynucleosis is, rightly considered, that of auto-sterilization, which does not always develop regularly. At times pus globules are found, they are polynuclears in the way of disintegration. Then a few drops of a chocolate serum or even of true pus are seen oozing from the wound. Even then, under the influence of the auto-sterilization, this passes away.

The end of the stage of auto-sterilization is marked by the disappearance of the germs and the appearance of the mononuclears. Ordinarily it is the lymphocytes which predominate and again it is the large mononuclears.

The author has noticed that there is no parallelism between the phagocytosis and the auto-sterilization; in some cases the microbes were ingested by polynuclears, auto-sterilization was slow, while it was very rapid in other cases where most of the microbes had remained free among the leucocytes.

This very interesting action is not surprising; a microbe ingested by a phagocyte is not always destroyed, the ingestion depends on chemiotactic phenomena which do not seem closely united to the microbicidal digestive properties of leucocytes.

Dr. Le Grand has studied auto-sterilization in relation to the microbian species. He has observed that the sterilization is particularly rapid with anaerobics and that it takes place principally in these cases by the mechanism of phagocytosis. He has only found specimens of the perfringens type.

With pyogenic germs, sterilization is slower. In wounds infected with staphylococci only, the auto-sterilization is somewhat rapid. But streptococci are the germs which resist auto-sterilization most. Their presence in a wound may always indicate the possibility of a septicemia.

Comparing the sterilization obtained by artificial and chemical applications and auto-sterilization, the author came to the conclusion, that sterilization by the defenses of the organism, when these are not disturbed, may be more rapid than when obtained by the action of a chemical agent. Some of these have a precious property of accelerating the elimination of mortified structures and their use must be reserved only when the excretion of bruised tissues is not effected: *it is a chemical bistouri.*

Dr. Le Grand adds that the use of cytophylactic liquids does not seem indispensable; the action of these liquids upon the recovery of wounds manifesting itself only when resorted to for wounds of bruised tissues.

In résumé, the conclusions of this valuable communication are that war wounds, with which these investigations have been essentially concerned, sterilize themselves when the resection of the contused tissues has transformed them into surgical and sutured wounds and while it is best to assist the means of defense of the organism, the important fact is not to disturb them.

ANTITOXIN IN THE TREATMENT OF TETANUS.—The following is obtained from extracts of papers published in the *Lancet,* and if not of practical application from the veterinary point of view they are nevertheless very interesting.

There are six methods of introducing the antitetanic serum in the organism: the intra-cerebral, the intra-venous, the intra-muscular, the subcutaneous, the intra-nervous and the intra-rachidian. The intra-cerebral and the intra-nervous are seldom utilized.

Dr. F. W. Andrews has widely experimented with antitoxin and records his experiments with the peculiar manifestations and results he has obtained, giving his statistics after careful consideration of the varieties of symptoms, of manifestations, of localized and generalized disease, of the risks that may be presented of anaphylaxis in subjects which might have received previously a preventive injection and after leaving aside the possibility of an infection by the intra-rachidian injection, which method he has in view, he summarizes his remarks by saying: "one cannot doubt the value of the intra-rachidian method for the introduction of the antitetanic toxin, notwithstanding all the doubts expressed against its use. It is the most powerful means that one has to save his patient and tetanus is such a dangerous and fatal disease that one

is absolutely authorized to hazard anything which may bring about recovery. At any rate, the risks are considerably less than with the intra-venous injection. In all rather severe cases the subcutaneous or the intra-muscular methods offer no advantage, nothing is gained and precious time is lost."

In another number of the *Lancet*, the respective efficiency of the intra-muscular method and the intra-rachidian are considered by Dr. David Bruce.

After referring to the classification given in the order of merit of the modes of administration of curative antitoxin, the author says that he will consider only the comparative efficiency of the intra-muscular and intra-rachidian methods, taking for the basis of his discussion experiments made on monkeys killed by tetanic toxin. Some of these monkeys were treated by intra-muscular injections of anti-serum, others by intra-rachidian injections.

The results obtained were conclusive. Of a series of 12 treated by intra-muscular injections of serum, none recovered. Of another series of 18 subjects treated by intra-rachidian method 13 recovered. In one case, the dose of intra-rachidian serum was inferior to the doses used in muscular injections and yet death came more slowly. In another case, the dose of intra-rachidian serum, though larger, was yet inferior to the smallest intra-muscular injections and yet the monkey got well. Again, two other animals which died in the second series had been intoxicated with large doses of toxin.

The superiority of the intra-rachidian method is manifest. In the cases treated by intra-muscular injections, death took place scarcely without diminution in the time ordinarily observed. Nearly all the monkeys treated by intra-rachidian injections recovered, those that died had received either too much toxin or not enough antitoxin. There were no experiments *in vitro* but on the living subjects. They were decisive. In one case all the monkeys died—in the other 13 out of 18 recovered.

Travelling Foreign Bodies.—If one will inquire into the bibliography of these moving foreign bodies, he will find many curious records of cases which no doubt will astonish and surely also interest him.

Our own literature is quite rich in them and the histories relating to cases of needles or nails found in different parts of the

body which they had reached after their journey from the digestive canal, are frequent. It is true that with veterinarians many of these cases were post mortem surprises. Seldom, in our experience are these detected during life and when danger of death is not in view.

It is not so, however, in human medicine where cases of much interest are recorded with the wonderful power with which the human organism accommodates itself to the presence of a foreign body which some time would prove fatal in the majority of cases.

Here is an instance I read in the *Chirurgie de Guerre* from Dr. Ascoli.

The case is the only one on record. It is that of a soldier, 22 years of age, who was wounded by a shrapnel ball.

A radioscopic examination revealed that the ball was located towards the middle of the left iliac wing.

Ulteriorly repeated radioscopic examination failed to trace the presence or the location of the ball in its original place. But in the cardiac region and more exactly in the right auricle the projectile could be seen moving with a pendular movement rythmical with the contractions of the auricle.

This pendular movement, which was 2-3 centimeters, was for the moment arrested on the internal end of its course, the body underwent a movement of spiral ro tion which brought it back to its initial position.

The wound of the soldier cicatrized, he recovered and when examined several months later, the radioscope revealed the ball in the right auricle.

The author did not dare to remove it.

SUMMARY OF CONTENTS OF EXCHANGES AND BIBLIOGRAPHY RECEIVED

VETERINARY JOURNAL, July—Stomatitis Contagiosa in horses. (O) Three cases of Equine sarcoptic scabies in man. Immediate objects as carriers of diseases. Tips on camels (Continued).

VETERINARY RECORD—Chloral intravenously as an anesthetic. (O) Do fistula of the poll and withers in the mare predispose to joint evil in the foal. Notes on an outbreak of contagious pneumonia in donkeys. (O) Post mortem. (O) Clinical notes.

July 14th—Luxation of the lens. (O) Peculiar case of foreign body in a horse. Fits in dairy cattle.

VETERINARY NEWS, June 23rd—Melanotic sarcoma in a mare. Pioneers in veterinary medicine.

JOURNAL OF COMPARATIVE PATHOLOGY AND THERAPEUTICS—Early history of veterinary literature and its British development (Continued). Poisoning of cattle with British Ragwort. (O) Rickets in donkeys. (O) Remarkable distortion of the neck in a foal. Treatment of specific ophthalmia. (O) Poisoning of cattle with horse radish. Tubercular mastitis in the cow.

IL NUOVO ERCOLANI, June 30th—Reaction intrapalpebral with tuberculin of experimental tuberculosis of horses in the tuberculosis of cattle. Upon the radical operation for naso- gutturo- fronto- maxillary polypi of horses.

CLINICA VETERINARIA, June 5th.—Osteomalacia in a young monkey. Dogs in the propagation of anthrax.

June 30th.—Sterility and abortion. Contribution to the diagnosis of diseases of the uterus.

ANNALES DE L'INSTITUT PASTEUR, May.—(X) Bacterio therapy in the treatment of ulcerative lymphangitis.

BULLETIN DE LA SOCIETE CENTRALE DE MEDECINE VETERINAIRE.—(X) Rabies in Paris. (X) Effects of mud. (O) Diffuse leiomyoma of the stomach and rupture of the organ. (O) Accidents due to Urtiba dioica. (O) Complete fracture of the intermaxillary bone. Auto infection of intestinal origin in long stabulation with animals traveling by sea. Asymmetry of the coxae in horses. (O) Extraction of a horse shoe from the thigh of a horse. Note on the period of incubation of epizootic lymphangitis. (X) Curative treatment of epizootic lymphangitis by vaccinotherapy. (X) Bacteriotherapy treatment of ulcerative lymphangitis.

REVUE GENERALE DE MEDECINE VETERINAIRE.—Remarks on mange and its treatment.

REVUE DE PATHOLOGIE COMPARÉE.—Utilization of seized meat after sterilization. Antitubercular vaccination.

BIBLIOGRAPHIC ACKNOWLEDGMENTS.—Secretary of Agriculture of Canada. Bacon swine and the English market.

BUREAU OF ANIMAL INDUSTRY.—Farmers bulletin 803. Horse breeding suggestions.

Bulletin 795—The domesticated silver fox.

REPORT of the Sanitary veterinary service of the Seine department during 1915.

CORNELL UNIVERSITY.—Announcement of the New York State Veterinary College for session 1917-18.

—Veterinary inspectors of the Bureau of Animal Industry have been added to stations engaged in hog cholera eradication as follows: Drs. Peter J. Cass and William E. Biles, College Park, Md.; Drs. Leo E. Lyons and Leonard S. Rohrer, Sedalia, Mo.; Dr. John W. Logan, Des Moines, Iowa; Dr. Virgil W. Knowles, Little Rock, Ark.; Dr. Gilbert S. Weaver, Brookings, S. D.

THE AVENUE OF INVASION AND THE BEHAVIOR OF THE INFECTION OF CONTAGIOUS ABORTION IN THE UTERUS*

W. L. Williams, Ithaca, N. Y.

Any intelligent effort at the control or cure of contagious abortion must be based upon some knowledge or belief regarding the portal by which the infection enters the uterus and the manner in which it acts therein. There are several very definite views, held by various investigators, of the primary invasion of the body. It is freely asserted that the infection may naturally enter through the mouth, vulva, and teat canal and that it may be artificially introduced into the subcutaneous tissues and into the blood stream. These are interesting theories which are in harmony with our general knowledge of contagious diseases. Generally, investigators have been content to introduce the infection through one of the alleged portals of entry and dismiss the problem until they believe the infection has appeared in greatly increased volume in the gravid uterus, and has caused disaster. Even the experimental proof of the contagiousness of the disease in cattle is very imperfect. The chronicity of the disease, the want of any recognizable period of incubation, the absence of any distinct lesion, and the inability of experimenters to induce abortion in cattle in any markedly greater degree than observed in cattle not experimentally infected, all conspire to render any hypothesis uncertain, even though many assert with confidence that this or that theory has been proven.

Once past this field of uncertainty, the student of abortion immediately faces a yet more doubtful question. If, for example, the hypothesis of alimentary infection is accepted, the student loses all trace of the infection process from the moment it enters the mouth. He does not know whether the infection penetrates the mucosa of the mouth, of the rectum, or of some intervening portion of the digestive canal and through it gains the lymph or blood stream. The infection once in the blood stream, the student is unable to follow the organism through the heart, through the pulmonary capillaries, back through the heart again, and thence

*Presented at the 54th annual meeting of the American Veterinary Medical Association, Kansas City, Mo., August 1917.

through the systemic arteries to and into the uterus. But it is not at all proven that the organism escapes through the digestive mucous membrane to cause intra-uterine infection. It may, so far as has been shown, multiply and persist in the alimentary tract, escape in the feces, enter the genital tract through the vulva, and thus gain the uterine cavity without having entered the blood stream at all. By modifying slightly the hypothesis of Schroeder, the infection might well escape in the feces, and, entering the udder through the teat canal, thence enter the blood stream and reach the uterus.

If the hypothesis of the circulation of the bacillus in the blood is accepted, the course of the infection still remains uncertain. If the infection reaches the uterus through the blood stream, it still remains to be shown how it escapes from the blood into the uterine cavity and into the fetus and its annexes. The studies of M'Fadyean and Stockman, and others, deny emphatically that the infection penetrates the placental filter. M'Fadyean and Stockman found the Bang bacillus first in the utero-chorionic cavity, second in the fetal fluids and fetal digestive tube, and last in the fetal blood. In no case did they find the bacillus in the fetal blood without recognizing it also in the fetal fluids and in the utero-chorionic space; the infection was frequently found in the utero-chorionic space and not in the fetal blood. If the bacillus passed the placental filter, the order of appearance would be inevitably reversed: it would appear first in the fetal blood and last in the utero-chorionic cavity.

Two plausible methods of invasion of the utero-chorionic cavity present themselves: through the uterine mucosa, from the blood stream, and through the cervical canal from the vagina.

The inter-cotyledonal mucosa of the bovine uterus is covered by a dense protective epithelium. It is neither known nor suspected that this membrane secretes or excretes actively either during pregnancy or during non-pregnancy. There is every reason to believe that it is an unusually dormant protective membrane. There is no ground for suspicion that the Bang bacillus or other comparable organisms ever escape from the blood stream, through this epithelium, into the uterine cavity. The placental areas, or cotyledons, when not in physiologic contact with the fetal placentae, offer an infinitely more inviting and less resistant avenue for infection. The epoch, however, during which this avenue is apparently open is limited.

In the non-gravid uterus, the placental areas apparently do not permit the passage of bacteria except during menstruation—a period of but twelve to twenty-four hours in each estrual cycle of about twenty-one days. During this brief period, if the infection of contagious abortion circulates in the blood, it may escape from the blood stream into the uterine cavity with the menstrual blood. Clinically, this possibility is seemingly supported by the observation that, the younger a heifer is bred, the more probably she will conceive. That is, the more frequently she menstruates, the more probable it is that the infection of contagious abortion may escape from the blood stream with the menstrual blood into the uterine cavity, become domiciled there, and prevent conception or destroy the fertilized ovum. Corresponding clinical evidences are not wanting in adult cows. When a cow is placed in a year test, she is not bred until five or six months after calving, in order to retain her milk flow at its maximum. As a consequence of this delay she menstruates probably five to seven times before being bred and, apparently, fails to conceive promptly because the abortion infection has become domiciled in the uterine cavity. There is, however, another explanation for these clinical observations which appears more logical. The menstrual blood poured into the uterine cavity affords an increased nutrient supply for any bacteria already present and each menstruation arouses and stimulates the infection anew, increasing the probability of sterility, and, conception occurring, increasing the peril to the embryo.

A second epoch during which invasion of the uterine cavity from the blood stream is invited is during the second half of pregnancy, when the fetal and maternal placentae about the internal os uteri commonly become detached and placental hemorrhage results. Placental hemorrhage at this point is so common that it may well be designated as "normal" in the sense that it is the rule in cows. There is no justification for saying it is physiologic. At this time it can only be said that it is usually present. After about the fifth month of pregnancy, if the uterus is sealed, a variable amount of hemorrhage is almost always recognizable just at the os uteri internum. Sometimes the blood clot is scarcely larger than a pea; often there are several ounces of blood coagula present. Several small placentae have become separated. No macroscopic evidences of inflammation are present. While many would call the phenomenon physiologic because it is the rule, I can not

harmonize such separation of placentae and subsequent hemorrhage with physiologic processes. It seems to me pathologic, even though this involves a belief in a well-nigh universal pathologic condition in the gravid uteri of cows. The phenomenon merits study. Like the menstrual hemorrhage, so the hemorrhage at the internal os of the pregnant cow, may, if we admit the circulation of the abortion infection in the blood, invite an invasion of the uterine cavity from the blood stream. As in menstruation, so here, the escaped blood affords nutriment for any bacteria present. From the unpublished investigations of Day[1], and more especially of Hagan[2], we know that pathogenic bacteria are commonly present in the sealed utero-chorionic space. It is not at all impossible that the presence of bacteria in the uterus at the internal os determines the hemorrhage and placental detachment. Hemorrhage into the uterus is one of the commonest phenomena in infectious abortion.

Most writers upon cattle abortion pass silently over these important questions. For example, Schroeder submits his hypothesis that the permanent rendezvouz of the infection is the udder. If I follow aright the theory of Schroeder, it is that the infection is, in at least some cows, permanent in the udder. When pregnancy ensues, the infection migrates from the udder to the utero-chorionic space, and may there cause abortion or other disaster. Soon after the termination of pregnancy, the infection retreats to the udder and disappears from the uterus. Thus it operates like a shuttlecock between the uterine cavity and the udder, but the path of migration between the two organs is not traced. He would account for at least some of the transmission of the infection from cow to cow through the agency of the infected hands of the milker. His hypothesis does not attempt to explain the prevalence of the disease in heifers in first pregnancy, whose milk glands have not functioned. Like most hypotheses, that of Schroeder is silent upon the actual time, place, and manner of the invasion of the uterine cavity.

The other possible avenue of entrance, the cervical canal, has not been more carefully studied by most investigators than has the invasion from the blood stream through the uterine walls. So far as known the infection may be readily introduced or may invade

1. Bacterial searches by L. E. Day, of gravid and non-gravid uteri of Abattoir Cows, conducted in 1910, in co-operation with the writer.

2. Bacteriologic investigations in the Department of Research in the Diseases of Breeding Cattle at the N. Y. State Veterinary College, Ithaca, N. Y.

the vagina and cervix through the open vulva, and if the cervical canal is open there is no material barrier to the penetration of the uterine cavity. It needs be recognized also that the vagina and cervix may quite as readily be invaded from the blood stream as may the uterine cavity itself. Should penetration of the vagina or cervix from the blood stream occur, it would appear that the subsequent invasion of the uterine cavity through the cervical canal may readily follow. It should be remarked that the vaginal and cervical mucosae are more active generally than the inter-cotyledonal mucosa of the uterus, consequently the invasion of the vagina and cervix from the blood stream is quite as probable as the invasion of the uterine cavity from that source. Clinical observations indicate that the cervical canal harbors infection more frequently than either the vagina or the uterus, but this is apparently due to mechanical causes, dependent upon the intricate folding of the cervical mucosa.

In studying the invasion of the uterine cavity through the cervical canal, two definite states must be considered—the open and the sealed canal. The cervical canal is termed open so long as it is not hermetically sealed, even though the opposing mucous surfaces lie in immediate contact. In physiologic pregnancy of the cow, the cervical canal becomes hermetically sealed within a few days after fertilization, by a tough, firm substance apparently emanating from the cervical mucous membrane.

The uterine seal has not been extensively studied. It is a highly interesting structure. So far as has been observed clinically and in the abattoir, it is a highly efficient bacterial barrier. There is no evidence that the bacteria can pass through it, and no strong evidence that bacteria ordinarily found in the genital tract can dissolve or break it down. Clinically, intense purulent vaginitis is observed, the uterine seal remaining intact and pregnancy continuing with apparent safety. Once the seal is formed, one frequently observes, in the abattoir, hemorrhages and the exudate of contagious abortion about the os uteri internum. Sometimes there are suggestions of partial destruction of the seal at its anterior end, but the evidence is not convincing.

On the other hand, there is indisputable evidence, both clinical and abattoir, of an inhibition of the formation of the uterine seal owing to the presence of infection in the cervical canal. In the handling of sterile cows, no more common condition is met than in-

tense chronic purulent cervicitis. Sometimes the condition is revealed by the visible presence of intense inflammation of the cervical mucosa about the os uteri externum; sometimes by the sclerosis of the mucous bases of annular cervical folds which displace the cervical canal and render the catheterization of the uterus difficult or temporarily impossible; and sometimes old caseated pus is encountered in the canal, or when the uterine catheter is introduced to the os uteri internum and a stream started through it, the first substance to return is a small quantity of muco-pus. Beyond, the uterine cavity is apparently clean and the uterus is normal in size, form and consistence. Such cows are intensely, but not absolutely sterile. Occasionally one becomes pregnant. Fertilization is favored by the great abundance of the mucus of estrum. The mucus so bathes the cervical mucosa that much of the more superficial infection is mechanically carried away, while the deeper seated infection is largely buried in the flood of mucus. The spermatozoa manage to elude the infection lying in wait, reach the pavilion of the oviduct, and fertilize the ovum. Then commences a battle for existence. My co-worker, Hagan, has shown that a bacillus belonging to the colon group is present in many non-pregnant bovine uteri, and that it is essentially as common in the utero-chorionic cavity of the pregnant uterus.

In a prior publication, I have shown that the fetus constantly swallows its amniotic fluid from a very early period, at least as early as hairs appear upon the skin, as is shown by the ready recognition of fetal hairs in the meconium at this early date. The discovery of this fact in fetal physiology has aided materially in tracing the progress of abortion infection within the uterus and revealed much of interest in the origin of the diseases of new-born animals.

Hagan has further shown by abattoir studies that pathogenic organisms invade the amniotic fluid from the utero-chorionic space (not through the placental filter) and, being swallowed by the fetus, are stored up as an integral part of the meconium, where after birth (and sometimes before) they play a vital rôle in calf scours. Associated with the colon organism, Hagan also finds an organism, not yet identified, revealing some of the characteristics of the Bang bacillus. It is highly significant that such infection prevails in so large a degree, whether the cow is pregnant or non-pregnant, and whether the cervical canal is sealed or open.

There is, however, a very interesting difference in the clinical picture and in the abattoir, whether the cervical canal of the pregnant uterus is sealed or open. In 1914[1], I pointed out that whenever the exudate of contagious abortion existed in the uterus, it was most voluminous about the os uteri internum and thence radiated forward toward the apices of the uterine horns. Numerous cases were cited in that report. Other investigators of contagious abortion in cattle frequently mention observing the exudate of contagious abortion in the uterine cavity, but usually refrain from locating it definitely. The one exception noted is an autopsy recorded by M'Fadyean and Stockman, in which, apparently incidentally and without attaching any significance to the fact, they state that the exudate was at the os uteri internum. More recent observations have slightly modified those of an earlier date. In several instances I have observed the exudate in the apices of the horns, notably of the non-gravid horn. Thus we may recognize three possible foci of infection: the os uteri internum, and the apices of the two horns. The first is by far the most important. It is not known that the infection advancing from the apex of either horn causes abortion, premature birth, or retained afterbirth.

In all cases where I have had an opportunity to study the behavior of the infection in the uterus immediately after abortion or premature birth or in cases where abortion appeared imminent and the uterine seal was absent or its integrity destroyed, there has been a well marked and characteristic metritis—the metritis of contagious abortion. The metritis is always most intense at the os uteri internum, from which point it radiates toward the apices of the cornua with constantly decreasing intensity. When the uterine seal is intact, there is no visible metritis. The exudate of contagious abortion may be present in cubic centimeters or in liters, but the metritis of contagious abortion is absent. Neither is there anything to suggest that, had the cow not been slaughtered, she would have aborted.

In one case, Bang records finding the abortion bacillus in the uterine cavity with a desiccated fetus. The inference was that the desiccation was a result of the abortion infection. Clinical observations largely justify such a belief. In this case the uterus is sealed, the exudate of contagious abortion is present, the intra-

1. Bulletin of the U. S. Department of Agriculture No. 106.

uterine infection causes a copious inter-placental hemorrhage detaching the fetal sac completely from the uterus, the hematome and fetus desiccate, the cervical canal is sealed, and no abortion occurs. Instead of the infection within the uterus causing expulsion of the fetus, it does the reverse and inhibits its expulsion indefinitely. The infection in the uterus, in the presence of a physiologic uterine seal, though it indirectly kills the fetus, does not cause its expulsion.

On the other hand, one finds time and again, in abattoir and clinic, uteri containing living young and devoid of a uterine seal. A portion of the fetal sac—the cervical portion—is necrotic and hangs out through the cervix in the vagina. Anteriorly the fetal sac is alive and the fetus for a long time also lives. I have been able to recognize at the same time the absence of the uterine seal, the necrotic segment of the chorion adjacent to the os uteri internum, and the living fetus which struggled violently when disturbed by manipulation. In other cases the embryo or fetus has perished, the uterine seal is wanting, and the progress of the infection from the cervical end of the uterus toward its apex is readily traceable. The necrosis is old at the cervical end; at the apical end the chorion is yet fresh. The progress of the disease is thus indelibly stamped.

In multipara the progress of contagious abortion in the uterus is revealed even more clearly than in unipara. Admittedly we do not know that contagious abortion in all animals is identical; presumably it is not. But there is probably an underlying principle common to all.

In personal discussions with colleagues, I am assured that in bitches, when gastro-hysterotomy is necessary for the relief of dystokia due to fetal emphysema, it is the basal fetus which has perished from the infection, while the apical fetuses are alive. The sow affords a more striking example, because it is highly probable that her contagious abortion is identical with that of the cow. Clinically, abortion is observed commonly in sows fed largely upon cow's milk and only rarely otherwise. Good has recognized the Bang organism in some outbreaks. Hagan finds the blood of sterile sows in an aborting swine herd reacting strongly to the agglutination test with the Bang organism. The swine had been constantly fed large quantities of milk from a badly aborting dairy herd. Especially, the pigs had been liberally fed upon such milk. When

they reached breeding age, sterility and abortion played havoc. In the abattoir, a brief study of uteri shows the advancement of the infection from the os uteri internum toward the apices of the horns, and that the advancement is usually slow. In one sow, with living fetuses two inches long, the basal fetus, lying in the right horn with the distal end of its sac occupying the uterine body, was necrotic and badly decomposed. The cadaver was one inch long. The second and third right embryos had perished and disappeared, leaving behind empty fetal sacs, which had continued to live long after the embryos had perished. The basal fetus in the left horn, and its sac, was necrotic, about one and one-half inches long, and not materially macerated. In this way it was graphically shown that the abortion infection had begun at the os uteri internum and had spread slowly and progressively toward the apices of the horns. The embryo already dead might at any time be expelled unobserved. Advancing slowly, some of the apical fetuses would probably mature, and, being then destroyed and macerating, cause dystokia, calling for gastro-hysterotomy.

Clinically the practitioner observes another marked evidence that the os uteri internum serves as a rendezvous for the infection of contagious abortion in cows. In retained fetal membranes, the basal cotyledons have frequently sloughed away, or inter-placental suppuration has forced the chorionic tufts out of the placental crypts. Further forward, the cotyledons are enlarged and firm; perhaps the membranes can be readily detached. Still further forward, the cotyledons are enormously enlarged, and the chorionic tufts are irremovably incarcerated. The inflammation has again originated at the os uteri internum, and has slowly travelled by continuity toward the cornual apices.

The spread of the infection is generally, but not always slow. Sometimes, when a fetus is nearing full term, the infection suddenly overcomes all barriers and runs riot. It may be—perhaps it is—a secondary infection. When the infection advances slowly, the cervical segment of the uterus becomes highly inflamed, while the apical end remains more or less sound and retains some of its vigor. The irritation in the cervical end arouses a repellant action in the uterus, and the fetus is expelled. It may be dead, or alive, and the afterbirth will probably be retained. If however, the progress of the infection is rapid, involving both fetus and uterus, the fetus may perish quickly, the cotyledons become necrotic, and the

entire uterus paretic or necrotic. The organ is now unable to expel the fetus; the cadaver macerates, becomes emphysematous, and may cause a rupture of the necrotic uterus with rapid death of the patient, or the uterus may adhere to the rumen and the fetus slough into it. The infection does not cause abortion; the cow can not abort.

Thus we see three distinct clinical pictures in connection with the death and expulsion of the fetus: 1. Desiccation or mummification of the fetus occurs, in which the fetus perishes within a sealed uterine cavity, does not undergo putrefaction, and is not expelled, but desiccates and remains as an inert body, inhibiting estrum indefinitely. 2. The formation of the uterine seal is inhibited, or if formed is destroyed, the infection advances slowly from the os uteri internum forward, the healthy anterior portion reacts to the irritant and expels the uterine contents. 3. The uterine seal is absent, the intra-uterine infection is virulent and spreads rapidly, causing necrosis of the uterus, emphysema of the fetus and inability to abort.

These studies, which are in conflict with no facts recorded by others, convince me that there are three foci in the uterus from which the abortion infection spreads: the os uteri internum and the apices of the two horns. From the standpoint of their power to induce serious disaster in the gravid uterus, the foci in the apices of the horns play a minor rôle. From the standpoint of sterility, the infection in the apices of the horns and in the continuous oviducts is of great importance. From the standpoint of both abortion and sterility, the infection of the cervical canal and at the os uteri internum plays the major rôle. The destruction of the uterine seal, or the inhibition of its formation, is essential to the development of the commonly observed intra-uterine disasters. My studies have led me to believe that the most prominent disasters caused by contagious abortion in the uterus are due to the infection having gained a habitat within the uterus, or rather within the cervical canal, prior to conception. By its presence the infection either inhibits the formation of the uterine seal or disturbs its formation in a manner to render it an insufficient barrier against invasion. While it is possible that intra-uterine infection sometimes breaks down the seal, once it has been formed, proof of such a theory is at present wanting.

The facts and conclusions here stated constitute the essential basis for the recommendations made from time to time regarding the control of cattle abortion. It has been urged, that, however the infection primarily invades the genital system, the chief agent at the command of the veterinarian is systematic hygiene of the genital organs, not for a day or a year, but a consistent permanent plan by which it shall be aimed to breed only those animals having as clean sexual organs as it is possible to secure and maintain. The plan involves the careful inspection of the genitalia of all breeding cattle, the exclusion from breeding of all individuals having evident disease of the genitalia until they are cured or recover, and the disinfection so far as possible of any part of the genital system of either sex, which is, or is believed to be, dangerously infected.

The original portal of entry of the abortion infection into the system in most cases of natural infection requires further study, but for the present the evidence points toward two great sources: 1. the intra-uterine infection of the fetus. In the aborted fetus investigators generally insist that the fetal cadaver carries the Bang organism, primarily in the digestive tube, secondarily in the fetal blood. They are silent regarding the other bacteria more commonly present.

Like all chronic conditions, the abortion infection cannot uniformly nor generally end in prompt fetal death. The fetus, whether premature or born at full term, must be largely infected at birth. My co-worker, Hagan, has traced this well, especially with a bacillus of the colon type. He recognizes the bacillus in the uteri-chorionic cavity of the cow, immediately after calving, and in the rumen and rectum of the new-born, apparently healthy calf. The same is true in the abattoir. He finds bacilli first in the utero-chorionic space, next in the fetal fluids, then in the fetal digestive tube. Clinically, the calf bearing alimentary infection at the time of birth frequently dies in a few hours from acute sepsis, and yet more commonly develops calf scours and arthritis. Later the survivors suffer from chronic arthritis, pneumonia, and chronic scours.

If such ante-natal infection is to be prevented, it is difficult to offer a better plan than the disinfection of the genital tube prior to breeding. This I have advocated for several years. The disinfection of the genital tube is inevitably imperfect. The anatomical disposition of the uterus and cervix renders their complete disinfection impossible. The technic has been greatly improved and is still

in its primary stages. Clinically it rarely succeeds, because it is rarely applied skillfully, conscientiously, and perseveringly. Whenever it has been so applied, it has been successful, sterility has been checked, the abortion rate has been lowered, metritis and retained fetal membranes have been greatly diminished, and calf scours and pneumonia satisfactorily repressed.

2. A second serious source of infection is contaminated milk fed to the new-born calf. The largest known volume of the Bang organism occurs in the utero-chorionic space of the gravid uterus, thence it escapes via the vulva before, during, and after abortion or parturition, along with other important intra-uterine infections, and flows down over the tail and escutcheon, to reach and contaminate the udder. From the exterior of the udder, the calf swallows the infection in sucking, or the milker gets it into the milk and feeds it to the calf.

Schroeder and others have discovered the Bang bacillus in the milk within the udder, but clinical evidences at present indicate that this has far less peril for the calf than has the infection which emanates from the genital canal and flows down over the exterior of the udder.

There is excellent and extensive clinical and good experimental evidence that, once the fetus or calf has become infected, the infection remains permanent, vacillating greatly in degree. It is especially significant that large groups of heifer calves, suffering severely from scours and pneumonia, abort very largely in first pregnancy. Apparently, while the system is depressed and wavering under the virulent bacterial invasion of scours and pneumonia, the infection shows an affinity for the genital system and acquires a habitat therein, where it remains until breeding age, ready to cause disaster.

Consequently the plan I have long advocated is: Guard carefully the genitalia of breeding animals of both sexes. Breed only those animals having clean genital organs, so far as can be determined by examination, disinfect as far as possible all diseased or infected genitalia before breeding, in order to repress sterility, abortion, metritis, retained fetal membranes, and the intra-uterine infection of the young. After parturition, disinfect the genitalia for the double purpose of protecting the new-born calf from the dangers of infection due to the contamination of the exterior of the

udder from genital discharges, and promptly restoring the genital system of the mother, preparatory to the next breeding.

At the close of the reading of the paper, Professor Williams exhibited a number of fresh gravid uteri of abattoir cows and sows. Healthy gravid uteri, containing healthy fetal sacs and fetuses, were shown, and in contrast diseased uteri and fetal contents.

The uterus of a cow about seven months pregnant was shown, in which the exudate of contagious abortion was present in large volume, being most abundant about the os uteri internum, and radiating forward, decreasing in abundance toward the apices of the cornua and disappearing entirely near the apex.

The pregnant uterus of a sow was shown, in which the basal fetus and fetal sac were necrotic and macerated until they could be handled only with care, lest they fall to pieces. The embryonic cadaver was about one inch long. The other fetuses were two and one-half to three inches long, and apparently healthy.

Other gravid porcine uteri were shown, mostly with fetal sacs having well marked necrotic tips, some without necrotic tips and apparently healthy, thus showing every gradation of necrosis of the fetal sac, including necrosis of the fetus itself.

DISCUSSION

DR. KNOWLES: As I understand it, Dr. Williams is going to say something more about the control of abortion in his statements tomorrow. Is that correct?

DR. WILLIAMS: There is not much to add to what I have said except possibly that when uteri are so badly diseased as those which I have just shown in both the cow and the sow, it appears to me we cannot hope that such animals will breed satisfactorily after the termination of the present pregnancy until the uterus is cleaned. Consequently the aim is, after such a uterus has been emptied to clean it out as promptly as possible and to restore the organ to its health. It makes no difference whether an animal gives birth to young at full term or at some earlier time, it is well to know that the uterine cavity is as healthy as it can be made before that animal is permitted to become pregnant again.

The question, of course, which has always been uppermost in the minds of many, is what shall be done with a pregnant animal to prevent it from aborting? What I really do when I know that an animal is on the way to abortion is to facilitate it. For instance, in such a cow as that from which I have just shown you the uterus, if I knew the fetus was in that condition I would like to get it out

as quickly as possible; and then to clean the uterine cavity from the infection existing there as far as in my power. We cannot do what we would like to do, but we must do the best we can.

DR. TORRANCE: In our country, some of our live stock organizations have passed resolutions on the subject of abortion, and our live stock men appear to think that it is up to the government to take some action to control the movement of animals affected with contagious abortion. I would like to ask Dr. Williams if he considers that any government is in position to form regulations of that kind. I would like to ask also of Dr. Williams this; it appears to me from his paper today that he is rather of the opinion that infection through the mouth is not the usual form of infection. I was rather convinced that his opinion is that the infection usually takes place through the genital organs. I wish Dr. Williams would make himself a little more clear on that point.

DR. WILLIAMS: I have long held that the infection of contagious abortion is essentially universal, that it is a chronic disease and varies in intensity from the point where it causes extreme disaster, to the vanishing point where we cannot recognize it. Under those conditions, any governmental laws or restrictions in regard to the disease, it seems to me would be out of place, and that the control of contagious abortion must be based upon a dissemination of basic knowledge among those interested in breeding. That is, it is the breeder who must take it up and not the government. The government should make the investigations, should gain the knowledge and distribute that knowledge, but leave it to the individual to control the disease.

In the dairy herds in the East there is no such thing as a noncontaminated herd, consequently, there is no such thing as a man selling a sound animal and being sure that it is sound. Consequently, any law that might be passed prohibiting the sale of animals infected with contagious abortion would be equivalent to saying, "Sell no animal".

I am glad Dr. Torrance has brought up the question of the avenue of infection. In my haste perhaps I did not make myself quite clearly understood. I most thoroughly believe that the original infection generally occurs through the mouth. I am equally emphatic in my belief that it occurs in the new-born animal and persists there, but that some infection is already in the fetus, that is, some fetuses are already infected at the time of birth, and that large additions are made to that infection by the discharge from the genital tract of the mother which flows down over her udder, tail and thighs and gets into the milk either when the calf is sucking, or when the milk is drawn from the udder, and in this way causes a large amount of abortion in heifers during first pregnancy. When it comes to the uterine cavity, at the time the animal becomes pregnant the infection gets into the canal somewhere in the

neighborhood of the os uteri internum, spreads forward to the apices of the horns gets into the fetal sac and causes destruction.

DR. STEINBECK: Does Dr. Williams think the organisms circulate in the blood?

DR. WILLIAMS: I do think they circulate in the blood, although at most times, perhaps, not recognizable, that is, the organisms would not be present in sufficient numbers to discover them, but I feel they must circulate in the blood. In a new-born calf only a few hours old, which had been received upon a sterilized sheet and which had been thoroughly disinfected and taken from the cow and fed on boiled milk there was acute arthritis, and from the infected joint there were obtained pure cultures of the abortion bacillus. I know of no way of its introduction but by circulation through the blood.

DR. RANCK: Would there be any possibility of transmitting this disease to pregnant cows in inoculating them with hog cholera serum that had been procured from a sow infected with the abortion bacillus.

May not the infection come from milking hands and through the invading of the teat opening or the milk duct?

DR. WILLIAMS: I am not familiar with the details of preparing hog cholera serum but unless efficiently filtered or sterilized I would think there was a possibility, of transmitting the infection in serum, but I do not consider it of very great consequence. In the East where wealthy gentlemen own big herds of pedigreed cattle, many of the herds are highly infected with abortion bacilli. Many of them also own herds of swine, in which there is a great deal of abortion and a great many herds go to destruction. Apparently they get the disease from the virulently infected cows' milk fed to the swine, not through hog cholera serum.

In regard to the infection through the teat canal, I do not consider it of very great consequence. When I go into a large herd, I take the blood from each calf and find that it reacts very quickly to the agglutination test. I do not deem it necessary to draw upon the alleged infection through the teat. I do not see how it could be introduced through the teat in heifers that had never been milked. While admitting the possibility of such infection, I do not think it plays a major role.

DR. FERGUSON: I would like to ask Dr. Williams what his opinion is as to the bull being a disseminator of contagious abortion and, if he does not consider the bull a disseminator of contagious abortion, how is the introduction of infection into an isolated herd accounted for, where it was never present before the introduction of the new animal? I can cite the case of several herds where the bull was the only animal introduced into the herd for a number of years, that is, occasionally a new bull.

DR. WILLIAMS: I have held for a number of years that we should always explain the term "introduction" as it relates to contagious abortion. In the first place, I do not believe that any herd in America, or in the world, needs any introduction to contagious abortion that the infection is there. But, there is another phase of that question of great practical importance, and that is that there are great variations of intensity of infection and by the introduction of an animal saturated with virulent infection great harm may be done.

In regard to the bull, I have never been able to understand why any infectious disease should be uni-sexual, that is, that it should involve only one sex. I can no better understand why contagious abortion cannot be disseminated by the bull than why gonorrhea cannot be disseminated by a man. I thoroughly believe the bull is an important disseminator of the disease. I am not ready to accept, in many cases, the immediate appearance of the disease after the introduction of the bull. I think the disease appears rather slowly, and I have long thought that one of the great sources of intense infection among beef cattle in the West has been due to breeders going to herds in the East where beef cattle are bred as a sort of side show along with dairy cows and the beef calves are fed the common milk of the herd. The bulls are sold to western breeders, and within one, two or three years after the bulls are introduced the disease develops. I believe this a very serious question which those interested in range and beef cattle should take seriously to heart. The question should be carefully studied. I believe when it is studied, it will be found that it is the most important element in the dissemination of contagious abortion in beef herds.

DR. QUITMAN: I would like to ask Dr. Williams if this disease is universal, if it is ever-present, how is it possible, as appears to be the case in some well authenicated instances, even in my own experience, that by the most positive, thorough, careful, continuous, hygienic methods, that it seemed possible to kill it out in a certain farm. I know of such instances where not a drop of medicine was administered, not a drop of any biological product was administered, nothing but uterine cleansings, and nothing in this direction was overlooked. It has been a matter of three or four years, and there has not been a new case on that farm. Prior to that time, for several years, it had been the bane of the existence of that owner, as well as others in connection with contagious abortion. I do not doubt your statements, but you have me puzzled.

DR. WILLIAMS: There is no material difference in the view expressed by me and the circumstances related by Dr. Quitman. They are absolutely in harmony. I hold, and have held, that if we will apply strict sexual hygiene, we will control contagious abortion so that it will be reduced to such an extent that you may see

no abortion for a long time in the herd. If you continue the rules of hygiene as you have outlined them you can make that condition as permanent as you desire.

DR. QUITMAN: I cannot see how, if the infection were ever-present within the animal, how the hygiene, carried out 100 per cent perfect, would so thoroughly eradicate it.

DR. WILLIAMS: Take it in the case of tuberculosis. We find that if persons afflicted with tuberculosis are placed under the best hygienic conditions, the symptoms of tuberculosis disappear, there are no tubercle bacilli in the sputa, there are no tubercle bacilli discharged by any of the excretory organs. The individual efficiency is increased, he is not sick; but you would not say that he is not infected, would you?

DR. QUITMAN: No, you are referring to what is called an arrested case.

DR. WILLIAMS: Yes, and that applies to abortion. You can arrest it and hold it in control. I would not say that it would be absolutely obliterated. I think it would be unsafe for us to take that position. I would feel unsafe in the herds you have spoken of, to say that it is eliminated and that you can sit down and let it go.

DR. BELL: I would like to ask Dr. Williams how he would look on the procedure of taking the temperature through the vagina and testing all the dairy herds around the state for tuberculosis?

DR. WILLIAMS: I would think the operation would be quite harmless. There is no use of testing a cow for tuberculosis, for instance, that has a dirty discharge from the vagina. That would not be good hygiene. You can transmit any disease in that way. But, assuming that a cow is decently clean, and the work is done with ordinary care, I do not see how there could be any great harm come from it.

DR. FERGUSON: I would like to ask Dr. Williams whether, in his experience in practicing hygiene in these herds, if he has been able to entirely clean up a herd. That is, so there is not an occasional heifer that has a retained after-birth, or some little trouble of that kind that develops in the herd, in spite of all of the care and disinfecting that he has administered?

DR. WILLIAMS: In the conditions of our eastern herds, I have never seen a herd completely cleaned up. We must always look upon our results as only partial. The hygiene is a problem which we must take up as a permanent measure and keep constantly at it. Then we can reduce the losses to the minimum, so that there will be no very severe losses from sterility, abortion, retained after-birth and so forth.

DR. FERGUSON: The reason I asked that question is because it coincides exactly with my experience in handling herds in Wiscon-

sin. I was never able to entirely clean up a herd, no matter how hard we kept at it. Later on, some heifer would develop sterility or retained placenta and so forth; but listening to Dr. Quitman I understand in the herd he had, it was entirely cleaned up, and that struck me as an extraordinary success.

DR. QUITMAN: In this instance, I was probably under more favorable circumstances than would be the case with the ordinary dairy or stock farm. This farm of which I spoke belonged to a doctor and an eminently scientific man, with a national and international reputation; yet, up to the time of my calling his attention to certain features he displayed a most surprising amount of ignorance on the question of the dissemination of this disease. He left it entirely to his farm manager, who was a graduate of the agricultural department of the University of Wisconsin, one of those men who could not be relied on even by virtue of a university education. He was a man you would call middle-aged. The university was unable to eradicate some curious ideas this man had. For instance, although he was a graduate of this school, he still held the opinion that if the placenta was forcibly removed that insured barrenness to the animal. I went so far, in my instruction to the doctor that if he wanted success he would have to procure a new farm manager, that a man with such ideas as his farm manager had never could be taught proper ideas. The result was, he was discharged and a young man put in who was also a graduate of that college, but one who had better sense and would listen to instructions. The doctor himself took instructions and made notes and made frequent visits to the farm to see that the instructions were being carried out. The young man, the new manager, was much interested, he had not been out of school very long and he carried out the instructions more in detail than the older man would have done. So, as I say, I believe I had extraordinary conditions there; although I had known, at least for a period of a couple of years, of farms remaining free where perhaps they were not so scientifically managed as this place. However, like Dr. Williams, you see I was not able to keep track of all of them as well as of this one and maybe there was an occasional mishap.

I would like to say, I find out as I go through the veterinary world, that many country practitioners, as well as city practitioners, do not know that there are limitations to the number of times a cow will abort, even if she does not become sterile. I wish that Dr. Williams would enlighten us on that point.

DR. WILLIAMS: A large proportion of cows that abort once are sold to the butcher or some one else who does not know that they have aborted. A far larger proportion of cows which have aborted twice follow that path and disappear. It is not very likely that a cow will abort more than twice, because, unless there is a revulsion in the system by which the intensity of the affection is minimized,

she fails to breed. She has come to the parting of the ways and either throws off the intense infection, or it destroys her value utterly and she disappears. Where they are kept and the attempt is made to breed cows, the number of times they will abort seems to be limited only by the tenacity of the cow by which she holds on to life.

One cow of which I have data, aborted at her first and second pregnancy (this is approximately correct), the third breeding year she was sterile, the fourth breeding year she aborted, and the fifth year she aborted and had a retained afterbirth and died from it.

In my work I find that each time a cow aborts her resistance to the infection is lowered. A small number of them do throw it off completely and thereafter do not abort, but that is not due to the fact that they have aborted. The safest cow in any herd is the cow that has gone through a number of pregnancies without abortion, without sterility or retained after-birth. If she has had none of these, she is more apt to be successful in the next pregnancy.

DR. ———: I would like to ask Dr. Williams if he thinks certain food conditions cause the abortion bacilli to become active, where if the food conditions were different the bacilli would be inactive?

DR. WILLIAMS: I have repeatedly stated in my publications that I most thoroughly believe in the influence of food upon the intensity of the infection. Whenever we lower the vitality of the animal by bad feeding, we tend to increase the intensity, not only of the abortion organism, but any other pathogenic organism which may be present in the body; and we know very well that we have a considerable variety of organisms mixed up in the great problem of contagious abortion. There is no question but that we can so feed an animal, or group of animals as to increase disaster in the herd.

On the following day the general subject of the abortion group of diseases was continued by Professor Williams in the clinic. Five sterile cows were presented for examination and for demonstration in connection with their handling. The cows were examined in detail by palpating the genital organs through the vagina and rectum.

CASE 1. A four-year-old pedigreed Jersey. She gave birth to a calf in 1915, at 287 days. She was then bred. We do not have a very accurate record of her breeding, but she was served several times. For a long time she has not been in estrum. We find that her general condition is good. The pelvic ligaments are normal, so that there is probably no serious cystic disease of the ovaries. The vulva is normal. The vagina is normal. The body of the uterus has what appears to be an abscess about three inches in diameter—

that is, the body of the uterus is filled with pus. The right uterine horn is slightly enlarged. The left horn, left oviduct, and left ovary constitute an enlarged irregular adherent mass six inches in diameter. The right ovary is normal. The right oviduct is normal.

Our diagnosis is abscess of the uterus, left ovary, and left oviduct. Our prognosis is that the animal is hopeless. We have applied no treatment. We merely made an exploratory catheterization of the uterus and verified the presence of the pus in it. We removed about a pint of exceedingly fetid pus.

The pus contained in the body of the uterus is quite evidently coming from the left ovary and left oviduct. That is, there is an abscess involving the base of the left horn, oviduct, and ovary, constituting a great adherent mass in the left flank from which there is a continuous flow of pus through the left horn into the uterine body.

We could clean up the uterine body temporarily, but more pus would at once flow back into it. We can not reach the abscessing oviduct at all, and consequently feel that it is useless to put the owner to any expense or trouble with such a cow. Instead she should go at once to the butcher, and the owner should take whatever salvage remains. This is one of the elements in our handling of the problem on which we lay great stress. We feel that one of the best services we can render to the owner of an animal is to say whether she can be bred. If she can not be bred, it is an economic wrong to the owner to cause him to keep her. It is an undue strain and peril to a bull which may serve the cow. Thus in a way we render just as great service in many cases, by deciding that an animal is hopeless, as we do by curing one, because we remove an animal which is a menace to the herd.

Case 2. A pedigreed Jersey cow from the same herd as Case 1. The animal now before you is older than the other. She was born in 1911. She aborted in 1916 on the seventh of March. As we get the history, she has not since been bred. She does not show estrum. She is normal in general condition, pelvic ligaments, and vulva. The vagina contains some pus. The os uteri is open. The uterus is about twice its normal size and sclerotic. The probabilities are that the mucous membrane of the uterus is completely destroyed, so that she is incurably sterile, but this I can not tell certainly.

The right ovary is one and one-fourth inches, with a deep cyst

or a deeply retained corpus luteum. The right oviduct is normal. The left ovary is one-half inch. The left oviduct is normal.

The prognosis is very bad. We have douched the uterus with a salt solution in order to wash out the pus, followed by a two per cent. Lugol's solution, and finally we have injected into the uterine cavity a suspension of about one dram of iodoform to about an ounce of oil.

This treatment might be repeated weekly for a little while, and, if the uterus softens, the cow may possibly be saved, come in estrum, and breed, but it is highly improbable.

Ordinarily we do not consider it worth while for an owner to keep such an animal at all. My advice would be to treat her for a while, and, if she does not become normal, to dispose of her to the butcher.

Early in my examination I stated that the right ovary is one and one-fourth inches, with a deep cyst, or corpus luteum. When we come to operate upon the ovary, we find it difficult and cause a little hemorrhage from the rectum. This we always aim to avoid, but once in a while it is inevitable.

You noticed when we were working that two hands were inserted, one in the rectum and the other in the vagina. I held the ovary back over the vagina with my hand in the rectum and asked my co-worker to insert his hand into the vagina and grasp the ovaries there. In cases of pyometra, if a corpus luteum is present, it is situated deep in the ovarian tissues, and is exceedingly hard to dislodge. In this case the application of firm pressure revealed the fact that we were dealing with a deep-seated cystic corpus luteum. When we applied pressure to the ovary, the cyst in the corpus luteum ruptured, and then following further pressure upon the ovary, the corpus luteum itself was forced out. That is to say, the corpus luteum was cystic in its center, but the lutein tissues persisted about the periphery, and, after some difficulty, we first ruptured the cyst in the center of the yellow body, and then, by intense pressure, forced the lutein, or yellow tissue, out.

Previously we stated that this cow has not been coming in estrum at all. It is quite possible that she will come in estrum after from three to six days because of the dislodgment of the yellow body. Should she do so, contraction of the uterus will be stimulated and the uterus will tend to eliminate the pus and infection. We have kept some of the pus for inspection. It is not very fetid.

The quantity shows how much pus may be present in cases where it can not be identified upon rectal examination, yet when we put the catheter into the uterus and start to douche, the actual condition is clearly revealed. The catheterization has played an essential part in the diagnosis.

CASE 3. A heifer born in 1913. She is four years old, and has not calved. She has been bred times without number. Her periods of estrum are apparently regular. The uterus is enlarged and flabby. It is about two or three times the normal size. The ovaries and oviducts are normal. Our diagnosis is endometritis.

If any pus was present in the uterus, there was not enough to discover it by palpation or catheterization. Nevertheless, we conclude from the uterine palpation that intra-uterine infection is present. We douched the uterus with two per cent. Lugol's solution and advise that in the future this be repeated once a week until the uterus becomes normal, after which we believe the patient will breed. She should recover.

CASE 4. The animal is one which aborted at 188 days in 1915. She had a discharge for some thirty days. I find there is a stricture at the vulvo-vaginal line, or hymeneal ring, which barely admits the passage of two fingers. I was able, however, to reach the vaginal end of the cervix with the two fingers through the stricture, and by this means to guide the forceps to the os uteri externum, fix them upon the lips, and draw the cervix back.

The uterus is large and flabby, which shows that endometritis is present. The right ovary is two and one-half inches, with cyst. The right oviduct is cystic. The left ovary is normal. The left oviduct is normal.

Our diagnosis is cystic right oviduct (hydrosalpinx) and endometritis.

Our prognosis is that the animal is absolutely sterile on the right, but may breed on the left side.

If we can rupture the ovarian cyst, get rid of it, and destroy its inhibitory power over ovulation by the other ovary, the cystic disease of the oviduct will not interfere with breeding on the other side. Quite a number of cows breed very readily when one oviduct is completely blocked, the other being open and healthy.

We have ruptured the cyst, although its rupture required considerable force. I trust you observed, as in the other case, that with one hand in the rectum I drew the ovary back over the va-

gina, while my co-worker introduced his hand into the vagina, grasped the ovary as it lay in my hand, and ruptured the cyst from the vagina. We can not with safety rupture most cysts through the rectum. A few of them which are very thin-walled can be ruptured per rectum, but on the whole it is a very unsafe procedure.

Our prognosis of this cow is bad, but it is not totally hopeless. We have ruptured the cyst. We have douched the uterus, and would advise that this treatment be repeated.

CASE 5. A pedigreed Jersey which calved apparently normally on July fourth, 1915. Since that time she has been bred ten times, without result. Her estrum is regular, the general condition good, the pelvic ligaments normal, the vulva and vagina normal. The mucosa of the vaginal end of the cervical canal is intensely inflamed, intimating that the mucosa of the cervical canal is highly inflamed throughout. The uterus is enlarged and flaccid, indicating chronic endometritis. Little or no pus is recognizable usually in such a uterus, but infection is present and plays a part in the inflammatory processes in the cervical canal. Right ovary three-quarters inch, normal. Right oviduct normal. Left ovary three-quarters inch, normal. Left oviduct normal.

Diagnosis: Severe cervicitis and chronic endometritis.

Prognosis: Good.

Treatment applied: We have douched the uterus with two per cent. Lugol's solution and swabbed the cervical canal with pure Lugol's solution. We recommend the repetition of the treatment once a week until the cervicitis is completely under control and the uterus is reduced in size and has recovered its tone. She should then breed.

(In order to illustrate the work to the best possible advantage, the lips of the os uteri externum were grasped by means of the uterine forceps, the cervix drawn back into the vulva, the forceps held apart, and the os uteri externum with its intensely inflamed mucosa clearly exposed to view. Each member of the association present was then given an opportunity to inspect the inflamed area visually).

This case affords an excellent illustration of one of the principles involved in sterility-abortion work. The presence of such cervicitis and endometritis, evidently makes it well-nigh impossible for the cow to conceive. Should the spermatozoa and ovum escape immediate destruction, we know that, in the presence of an embryo, infections present in the uterine cavity multiply with re-

newed vigor. It is also becoming more and more evident that, not only is the volume of the infection increased, but the virulence also. It must be clear to each of you that, with intra-uterine infection sufficient to cause the enlargement and loss of tone recognized in the uterus, a fertilized ovum would be placed immediately in peril. An indelible record of such peril is made in the necrotic tips of the fetal sacs shown you yesterday, in conjunction with my paper upon abortion. These necrotic areas show well beyond dispute that an infection is virtually always present in the uteri of ruminants and swine and that such infection is competent to cause necrosis of the apices of the delicate fetal sacs. A careful study of pregnant uteri shows every possible gradation of necrosis of the tips of the fetal sacs. Bacterial searches show that the infection penetrates the fetal fluids and is swallowed by the fetus, inducing fetal disease (fetal scours) or, stored up in the meconium, induces the most serious maladies of the new-born—septicaemia, scours, arthritis, pneumonia, etc. Hence we desire in chronic endometritis to disinfect as far as possible (it can only be partial) the uterine cavity prior to breeding. The same principle is yet more true of cervicitis. So long as a purulent cervicitis is present, conception is extremely doubtful, and, in event it occurs, the embryo, or embryos, is placed in extreme peril. A safe issue of pregnancy under such conditions is difficult to comprehend. The purulent cervicitis inhibits the formation of the uterine seal or prevents its complete physiologic development. The cervical canal remains open or inefficiently sealed. The infection lodged in the depressions of the intricately and deeply folded cervical mucosa persists and maintains, by interfering with the sealing of the uterus, an open gateway from the exterior into the uterine cavity for other bacteria than those already resident. The infection already present in the anterior portion of the cervical canal multiplies about the os uteri internum, and thence radiates forward toward the apices of the horns. In the meantime the infection penetrates the fetal membranes, finds a favorable place for multiplication in the fetal fluids, and is swallowed by the fetus, along with the amniotic fluid. Then follows the long and serious train of disasters—abortion, premature birth, retained after-birth, metritis, calf scours, calf pneumonia, etc. Hence we wish to control cervicitis before permitting the cow to be served. In obedience to a well established law that infections of the genital organs are intensified by coitus, there is double rea-

son for not permitting such a cow as Case 5 to be served. First, it places upon the bull a wholly unnecessary and useless tax. Second, the infection in the genitalia of both bull and cow is intensified, and lasting harm done. Hence the rule: *Permit no cow to be served by the bull until it is reasonably clear that she will conceive and that her genitalia are in a condition to warrant the belief that the pregnancy will be safe.*

In conclusion, I hope that certain fundamental principles regarding the problem of sterility in cows have been illustrated by the five cases presented:

1. The problem of sterility in cows is on the whole an integral part of the great problem of contagious abortion—a badly misnamed disease involving the whole problem of reproduction and constituting the greatest single problem in cattle and dairy husbandry.

2. The handling of sterility must be based upon thorough knowledge of the anatomy, physiology, and pathology of the genitalia. To this must be added a careful and complete examination upon which a reliable diagnosis and useful prognosis are to be based.

3. The exclusion from coition of all animals not capable of safe breeding. Those which can not be cured should be excluded from breeding and slaughtered promptly. Breeding them constitutes a menace to the herd. Curable animals should be cured as promptly as possible. They should not be bred until cured.

4. I hope you have observed that the uterus was catheterized for two purposes—diagnosis and treatment. Frequently a uterus may feel normal in volume and consistence, when palpated per rectum, but catheterization reveals that it contains an appreciable, though small, quantity of pus. This knowledge is essential to a reliable diagnosis. When we wish to disinfect the uterus, the catheterization and douching constitutes our best means. When a retained corpus luteum is present, its dislodgment causes the uterus to contract and tends to cause it to expel the resident infection, but this resource should be used to supplement the uterine douching—not supplant it.

5. I have used no force in introducing the catheter into the uterus. The modified Palmer uterine dilators are well adapted in size and form to follow the intricately bent cervical canal. Formerly veterinarians talked much of the "closure of the os uteri" or "closure of the womb", until it had acquired a prevalence equal to that of "hollow horn" of earlier days. Atresia of the cervical canal in cows is essentially fiction. As a congenital condition, it exists rarely, along with a general arrest in the sexual development. Speaking generally, the cervical canal is open and passable, but its

penetration is rendered more or less difficult by the complex anatomical arrangement of the cervix. The difficulty is further and greatly intensified by disease. The circular folds of the cervical mucosa with their margins directed vaginalwards, cause the catheter or sound to be deflected and lodged in a cul-de-sac behind the folds instead of following the cervical canal, which perhaps bends abruptly in some direction. In cervicitis (and when metritis is marked, the pus passing out through the cervical canal inevitably causes cervicitis) the bases of the circular folds become enlarged and sclerotic. The sclerotic mass pushes from one side and bends the cervical canal out of a straight line sometimes as much as two inches. The veterinarian who is ignorant of these facts concludes that the canal is "closed", erroneously thinks that force is justified and demanded, applies it, ruptures the cervix or uterus, and ruins or kills the patient.

I have found this one of the greatest drawbacks to the work in which I am engaged. A man watches me at my work for an hour or two, and concludes that he has learned all that I have gained during twelve or fifteen years of conscientious study and investigation. Some veterinarians who have watched me for three or four hours have advertised that they have taken a special course under me, have inferentially learned all that I know and made some highly important advances. Among their first accomplishments, is the killing of a number of highly valuable cows, by rupturing the cervix or uterus; the aborting of cows which were safely pregnant (except they fall in the path of the embryonic specialist in sterility); or sending to the butcher as incurably sterile, cows four to seven months pregnant. As a result, the work I am striving to accomplish is brought into disrepute, and the wildcat veterinarian disgraces himself and the profession.

There is no more important field open to the veterinarian, and there is no field which calls for more conscientious, careful, and constant study. The field does not lend itself to charlatanism, as boring for "hollow horn", slitting the tail for "wolf in the tail", injecting abortion bacterins for controlling abortion, or drawing "wolf teeth" for curing ophthalmia. The charlatan runs a short race, and is soon stopped by his own malpractice. It is an extremely dangerous field for the charlatan, the ignorant and careless veterinarian, the veterinarian who is in a hurry, and the inherent fool. These quickly destroy themselves. On the other hand, any conscientious, careful, and reasonably skilled veterinarian may by conscientious study and work fit himself to render a highly important service to cattle breeders and dairymen and, by conserving their interests, render a notable service to the state.

THE ABDERHALDEN TEST FOR PREGNANCY IN ANIMALS

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After Abderhalden published his first article on the defensive ferments of the animal organism, in 1913, a large number of publications appeared all over the world, some for, and some against the test.

These variations in results are probably due to the variations in the fundaments and technic used by the different workers and also to limitations of the tests that are not yet understood or even known.

In the following I shall try to interpret Abderhalden's ideas regarding the theory of the defensive ferments, and his technic and results.

The Abderhalden test is not a test for pregnancy but a test to determine the presence or absence in the serum of ferments capable of digesting placental albumins, which are believed to be somewhat disharmonious substances and are present in the blood-stream only during pregnancy. The animal organism permits only material that has been put in harmony with the body and particularly the plasma to reach the circulation. Abderhalden compares these proceedings very appropriately with a workshop as follows: in the production of an article, one machine prepares the material for another and one workman transfers to another, material which is finished to a certain degree. In a like manner do the tissue cells mutually support each other in their task. The cells of the intestine and liver especially act as important sorters for the whole organism. If insufficiently transformed substances penetrate into the general circulation, we must expect troubles of all kinds. In such a case the organism defends itself against injury; it produces certain agents against the disturbing elements, i. e. defensive ferments.

Abderhalden made his first experiments with dogs and rabbits. He injected the white of an egg or horse serum intraperitoneally into these animals; it was found that the contents of the blood increased in peptolytic ferments as early as the next day. It is interesting to note that ferments persist for a long time after the introduction of the disharmonious substances; furthermore that

such plasma of especially treated animals, which had been shown experimentally to be active became inactive when heated to 60° C., i. e. its decomposing action could no longer be determined.

How can we explain the existence of such defensive ferments during pregnancy? Abderhalden answers this question as follows: the organism of the mother has at its disposal, up to the appearance of pregnancy, a certain amount of cells of a certain kind, which all harmonize with each other in their metabolism. After conception there appears an entirely new kind of cells which have to perform particular duties. Although the impregnated egg and the developing placenta with all its various cells are in harmony with the species, nevertheless the metabolism of all these cells actually is something new and foreign to the complex of cells composing the organism of the mother. The blood probably receives substances, perhaps also secretions, which are out of harmony with the plasma and remain so, the time being too short for the blood to accustom itself entirely to these new substances. After the expulsion of the placenta, in which process ferments probably play a preparatory part, the ferments quickly disappear.

These ferments may be demonstrated within about 8 days after impregnation, and they disappear within 14–21 days after expulsion of the placenta. From this experience we are able to decide, whether a placenta is actually in existence, i. e., one, which is still in communication with the organism of the mother.

The ferments are strictly specific, so that animals suffering from infectious diseases or of malignant tumors do not react to the Abderhalden test for placental tissue at all; therefore we should always test a serum not only against placenta but also against a number of fundaments prepared from other tissues and tumors. A positive test with placenta fundaments (the tests with other fundaments being negative) means the presence of specific ferments for placental albumins, from which we infer that the animal harbors placental elements. It does not necessarily mean pregnancy, however, as the positive reaction may be due to retention of syncytial cells in the uterus, hydatiform moles and chorioepithelium. It is known (and I have had a few such cases) that animals suffering from pneumonia and pleurisy with a particularly high leucocytic count gave a somewhat confusing, weakly positive reaction to placental tissue. These non-typical positive reactions may be due to the presence of non-specific ferments derived

from the leucocytes. We know that the leucocytes secrete proteolytic ferments as they are principally concerned in the liquefaction of pneumonia exudates and, in tissue secretions, an area of liquefaction may be seen surrounding the leucocytes; these ferments would react with a number of fundaments. Such blood is not suitable for an Abderhalden test and it is to be discarded.

It is very important, to have enough experience to judge, which serum is suitable for a test and which is not suited. Therefore, whenever possible, I first have a complete blood count made of the blood in order to eliminate all cases of leucocytosis. Furthermore, I give the animal a good laxative the day before bleeding and make sure that it has been fasted for a sufficiently long period before being bled, because, especially in herbivorous animals the blood after digestion contains a large number of split products of proteins such as peptons, metaproteins, proteoses, etc. These products would greatly interfere with the exactness of the test and such sera are easily eliminated by proper controls. The serum used for the test must be free from red blood corpuscles and hemoglobin, therefore, we have to draw the blood with a sterile and absolutely dry needle and allow it to run into a sterilized, dry tube. This is very important, because, even a very small amount of moisture remaining in the needle or tube would cause rapid hemolysis. The blood is then put away in a cool place and allowed to clot. After the clot is formed, the blood is placed in the icebox where, in a few hours the serum begins to separate and it can be easily decanted and centrifugalized without injuring the red blood corpuscles. In this way an absolutely clear serum can be obtained which is free from hemoglobin and blood corpuscles, and the results will be correspondingly satisfactory.

It is not my purpose to go into the technical details of this test as all this is published in many journals and books. I only desire briefly to mention the principle of the method and some experiences and modifications I have found practical and reliable.

We have two methods of performing the Abderhalden test: the optic method and the dialysation method.

The Optic Method. This is more difficult to perform than the dialyzation method, and requires expensive apparatus. Consequently, I will not consider it further.

The Dialyzation Method. I will describe only the improved technic of Abderhalden, as given in his latest publication. There

are several steps in this procedure, the first and most important step being the preparation of the fundaments or substrata.

The placenta is freed from all fetal tissues and membranes and cut into small pieces. This is the method recommended by Abderhalden. I have found that in my experience that it is some times difficult to prepare a proper substrate in this manner, because blood vessels, parenchymatous and connective tissue cannot be absolutely eliminated. For this reason, I have entirely changed the mode of preparing the placental substrates in so far as I do not cut the placenta in pieces but scrape it with a somewhat dull knife in order to get only placental tissue and entirely eliminate the stroma. These scrapings are washed free from blood in running water. They are then placed in ten times their volume of distilled boiling water, containing a few drops of acetic acid. The boiling is repeated about five times, until the filtered boiling water gives no ninhydrin reaction when using one c.c. of a one per cent ninhydrin solution to 5 c.c. of the boiled water. The washed placental tissue is kept under toluol until needed. Abderhalden recommends boiling each so-called "stock fundament" each time before using until a negative ninhydrin reaction is obtained. This also reduces the number of errors in succeeding tests.

The DIALYZERS consist of porous parchment paper. They are to be tested carefully as to their permeability to pepton and their nonpermeability to albumin.

NINHYDRIN, or triketohydrinedhydrate, is a salt which produces a colorless solution with water and, when mixed with a solution containing the amino group in alpha position to the carboxyl group, gives a violet color upon boiling; thus, albumins, peptons, polypeptons and amino acids all give a positive reaction. Ninhydrin does not detect very small amounts of these substances and because of this very fact it is useful for this test..

In order that I may have my dialyzers always ready for use, I keep them in well stoppered and sterile containers, which are prepared in the following manner: as containers I use test tubes of prima Jena-glass, scrupulously cleaned and afterward washed with double distilled water. These are one inch in diameter and seven inches high, so that, after the dialyzer thimbles are inserted, a space of about 1/10 inch remains between the dialyzer and the wall of the container. The dialyzers are fastened to a narrow glass tube about ½ inch in diameter, which tube is passed through a perforated

rubber stopper, in this way closing the container against the outside air. The narrow glass tube is plugged with cotton. The container is filled with 20 c.c. of double distilled water and the whole outfit autoclaved and therefore absolutely sterile and protected against contamination and always ready for use. I believe that this method also greatly reduces the number of errors, since contaminations must be absolutely avoided.

TECHNIC OF THE TEST. About one gram of the placental substrate is placed in the dialyzer through the inner glass tube, without opening the container. One and a half c.c. of the suspected serum is added and then a few drops of the toluol after which the whole is incubated for 16 to 18 hours at a temperature of 37½°C. At the end of this time the dialyzer is removed from the container and 10 c.c. of the dialyzate is placed in a small beaker; 0.1 c.c. of a one per cent solution of ninhydrin being added. It is then boiled for exactly one minute from the time the first bubbles rise. This boiling is done preferably on an electric stove, the controls being boiled at the same time and at the same temperature so that the test is absolutely equal in all points.

The controls consist of the following: one tube containing only the substrate with one and a half c.c. distilled water; another tube containing only one and a half c.c. of the suspected serum; control tubes with placental substrate and inactivated (heated to 60° for a half hour) serum, and a tube with inactivated serum only, are interesting but not absolutely necessary.

Abderhalden suggested in a later publication that the test be made without a dialyzer-membrane. For this the serum should be placed in a test tube together with the substrate; after incubation the albumin of the serum is precipitated through coagulation. The filtrate is then tested with ninhydrin. I had several that reacted the same way with the old and new method. The new method is more difficult and requires some chemical experience.

Abderhalden published suggestions for another comparatively simple test without dialyzers which is made as follows: the substrate is colored with aniline (carmine) and afterwards washed till no more of the stain can be washed out. Then the serum to be tested and the stained substrate are brought together and incubated the usual time. If ferments that are capable of digesting placental tissue are present in the serum, the latter will be broken down and the serum will be colored by the aniline stain which is thus freed.

If no digestion of the substrate takes place, the serum remains uncolored.

I believe that a test without dialyzers is the ideal Abderhalden test and that many of the failures due to the dialyzer thimbles will be eliminated thereby.

THE PRACTICAL RESULTS OF THE TEST. I started my experiments in June 1913, soon after Abderhalden's first publication on the subject had appeared. Since then I have tested 497 sera for pregnancy and am just as enthusiastic about this work now as I was the first day.

It would be going too far to attempt to describe every individual test; for the sake of brevity, I shall condense this part of my paper as much as possible.

Of the 497 tests, 260 were experimental; 101 sera of the remaining 237 cases were received in an unsuitable condition, being either contaminated or hemolyzed or containing peptones, amino acids, etc. This leaves 396 sera which were subjected to the routine test. Of this number 225 were positive and 171 negative; of the former, 147 were experimental and of the latter 113; the others were clinical tests.

Of the 136 sera furnished from outside which were suitable for the test, clinical reports were missing for 58. Therefore, aside from my experimental cases, I have only 78 confirmed cases to report. Of these 78 cases only 5 tests failed to turn out satisfactorily—the sera showing a positive reaction while the animals were not proven pregnant clinically. Here we have to reason with the possibility that positive reactions may be due to the retention in the uterus of syncytial cells or chorio-epithelium. This is often found, especially in cows; but, after all, the percentage of failures is so slight that it does not affect the reliability of the test materially. Of the 78 confirmed cases, 18 sera were obtained from cows, 28 from mares and 32 from dogs. In virtually all these cases, the blood was taken between the second and third week after assumed conception.

One of the horse cases was particularly interesting. The pony, used by an acrobat on the stage, was accidentally covered by a pony stallion, which caused the owner to fear that he would be unable to continue his act in case the pony had been impregnated. Thereupon he called in a local veterinarian who, wishing to do all within his power to help the acrobat, flushed the uterus of the

pony with a strong astringent. The veterinarian asked me to make an Abderhalden test, which proved positive on the tenth day after coition. I did not hear from the acrobat for two years when, one day, he called on me to tell me the news (sad for him, and joyful for me) that the mare had thrown a nice colt after the usual period of pregnancy.

I desire to report another case in a dog, where a veterinarian suspected a high priced, middle aged bulldog of being pregnant. The dog was terribly fat, causing the abdominal examination to be very difficult. I made an Abderhalden test with negative result. Believing in the reliability of the test, I recommended a laparotomy, which disclosed a good-sized ovarian tumor.

In my 260 experimental cases a large number of interesting tests might be reported, but as this would take up too much of your time, I rest content with the relation of only one case in a dog. I was present when the bitch was bred. I made several Abderhalden tests before she got in heat and, during the oestral period, all tests resulted negatively. After assumed conception, the tests were continued every day until the ninth day, at which time a weakly positive reaction was observed. The next day the reaction was more marked and continued so until 20 days after parturition. Altogether about 20 tests were performed during this experiment which clearly demonstrated the gradual appearance and disappearance of the defensive ferments against placental tissue.

Conclusions. 1. I consider the Abderhalden test for pregnancy in animals very reliable if a scrupulously exact technic is employed.

2. Much care should be taken in preparing the substrates or fundaments and in the selection and the use of the dialyzers.

3. The blood which is to be examined must be taken in an absolute stage of hunger, and must be free of hemoglobin and blood corpuscles, and from all contamination.

4. Whenever possible, the animal should be examined for the presence or absence of any kind of leucocytosis.

DISCUSSION

Dr. Harris: I would like to ask in regard to results of the use of this test in cases of abortion. The statement was made that diseased conditions of the ovaries produced affirmative or positive results in the state of pregnancy. I would like to ask what his experience has been along that line.

DR. ZELL: I had only two cases of abortion which acted positively. My experience in cases of abortion is quite limited. I believe we got a positive reaction in these cases quite a time after the abortion took place. I expect about twenty days after the fetus is expelled a positive reaction will be given.

DR. HOLMAN: I would like to ask how soon a positive reaction in a cow or horse can be expected?

DR. ZELL: In eight or ten days.

DR. HOLMAN: After copulation?

DR. ZELL: Yes, that would be the earliest time.

DR. SLAWSON: How long does the test take after you start it? In what time can it be performed?

DR. ZELL: It takes sixteen to eighteen hours to perform the test, not counting the time to prepare the serum, and so forth.

DR. SLAWSON: How long can a practitioner wait for the test?

DR. ZELL: If the serum is sent in one day the test can be taken the next day.

DR. KNOWLES: In order that the test should be of practical value to the practitioner, it would be necessary for him to be able to inform his client how much it is going to cost. If Dr. Zell, or other laboratory men, have to put in sixteen to eighteen hours steady work in making this test there are not very many dogs, or some cows that would be of sufficient value to pay him for his services. The reason I ask the question is in order that the practitioner might know whether it could be made of practical use.

DR. ZELL: The test, like all biological tests, is five dollars. You can accomplish it in eighteen hours, because about sixteen hours is given up to incubating. It is not continuous work for eighteen hours.

DR. KNOWLES: As I understood his report in the beginning, the test is not certain. Suppose I sent you a sample of blood to make the test. You made a report of it as positive. There are disease conditions which may produce that reaction just the same as a condition of pregnancy. Am I right?

DR. ZELL: Yes.

DR. KNOWLES: Then of what value is the test?

DR. ZELL: Just the same as the Wasserman test in syphilis in the human. The physician has to combine the biological with the physical symptoms. It is the same with the Abderhalden test. We can only do the testing and you have to do the clinical examination and then you can combine the diagnosis. It is just a help.

DR. MITCHELL: The only thing a man could send, Dr. Zell, would be serum?

DR. ZELL: Yes.

DR. MITCHELL: He could not send the blood?

DR. ZELL: No.

DR. MITCHELL: Even if only twenty-four hours from Chicago?

DR. ZELL: No, because the blood hemolyzes.

DR. FERGUSON: What is the technique for handling? You draw the blood with a sterile needle and dry sterile tube?

DR. ZELL: Yes, and place it in the ice box. The serum appears on top of the blood and you pour it off in another sterile tube and send it in.

DR. STEINBACH: What per cent of the tests would you consider accurate?

DR. ZELL: I have quoted in my paper that I have seventy-eight cases where I got results. In seventy-eight cases that were confirmed I had five failures. That means ninety-four per cent of the cases, and in the Wasserman test we consider eighty-six per cent as correct. It is more approximate than the Wasserman test.

TREATMENT OF EQUINE PNEUMONIA*

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The common term pneumonia signifies inflammation of the pulmonary tissues and as these tissues are subject to many forms of inflammation, the etiology and termination of which are so very different, the treatment must vary greatly and the general constitution and environment of the individual case must be carefully considered.

The treatment of pneumonia in general is entirely too extensive a subject to be discussed on an occasion like this, so I will endeavor to confine myself to the treatment of that form of equine pneumonia so common in practice, usually considered sporadic in character, possessing a typical train of symptoms, via sudden onset, rapid rise of temperature to a certain height, continuing at a high level for several days, then gradually or suddenly falling to near the normal point and terminating in complete convalescence; this is usually described as fibrinous or croupous pneumonia.

While such pneumonias are usually considered sporadic, they are perhaps always due to bacterial invasion. The causative agents are generally saprophytic and found on the mucous surfaces under normal conditions, but become pathogenic under certain physical conditions or environments and may be transmissible under similar

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conditions of other individuals, or they may become so virulent in their nutritious host as to become pathogenic in healthy individuals.

Pneumonia, being an inflammatory disease, has been treated from the earliest history of medicine by sedative means, or more properly speaking by the process of starvation by lessening the circulation to the part.

To accomplish this in an organ like the lungs, we must lower blood pressure by minimizing the force of the circulation. This idea is practical in dealing with such organs as the brain, liver, kidneys, etc., as well as many of the less vital organs, but not so with the lungs.

In order to understand the reasons for this difference, we must study the anatomy and physiology of circulation and respiration. As all the blood of the body must pass through the pulmonary capillaries on its route from one part of the heart to the other before supplying the tissue, and as all tissue depends upon the circulating medium (the blood) for nutrition, oxidation and elimination, it becomes very evident that the circulation must be maintained.

Add to this knowledge the fact that oxidation and elimination must largely take place through the walls of the pulmonary capillaries and we should at once understand the importance of maintaining a full, strong, effective circulation.

Pulmonary arterial blood pressure is quite strong under normal conditions, thus placing a heavy load upon the right heart at all times. This resistance becomes intensified in pneumonia in an exact ratio to the extent of pulmonary tissue involved and the degree of engorgement and effusion present.

When we thus consider the important functions of these vital organs, can we doubt for a moment the danger of administering heart depressants in acute pneumonia?

Many practitioners of medicine maintain that they have depended upon heart depressants for years with good results. Might we not inquire what are these good results? Many animals, man included, live through severe attacks of disease and fully recover and is it not equally true that some live in spite of both disease and treatment?

Does claimed success from irrational medication add anything to the argument in favor of its use?

Hutyra and Marek state that pure, uncomplicated pneumonia

needs no medicinal treatment. This would certainly be far better than irrational treatment.

Some large horse dealers have discontinued medication to their pneumonic patients and simply turn them out in a lot with the results of greatly diminishing, if not almost entirely overcoming the loss previously so heavy from pneumonia. When we compare these results with the evidence we find of the ravages of pneumonia in our death reports, burying grounds, dessicating establishments, etc., is it any wonder that the science of medical therapeutics is on the decline? Is it not time to supplant egotism, based on imaginary results, by true science?

Medicine, one of God's richest gifts to man is too often made to appear ridiculous by the ignorance of man.

In our treatment of pneumonia, I fear we too often fail to differentiate between pneumonia and the conditions of organs that are so often brought about by the effect of non-oxidation and non-elimination, which often calls for very different treatment from that needed in pneumonia and makes pneumonia patients really fit subjects for medical therapeutics.

Fever is too often considered a disease, when in reality it is only a symptom of disease and may be a factor in the destruction of the causative factors of disease.

The bacilli so prevalent in typical pneumonia apparently have a low heat resistance and laboratory experiments have apparently demonstrated that a temperature of 105 to 106 degrees F. soon greatly reduce the vitality of cultures, and if continued for a few hours, destroys them, while a temperature of 107 degrees destroys them very quickly.

Is this not the secret of the so-called abortive pneumonia?

How many of us, in active practice, have seen many cases where an apparently healthy horse in the morning, or possibly at noon, came in from his work at night, with head down, nostrils distended, respiration hurried, pulse accelerated, in fact to the trained eye, the very picture of pneumonia. On taking the temperature, we find it to be as high as 106 to 107 degrees F. and an alarming, if not unfavorable prognosis was given. On our return call the next morning, to our surprise, practically all our unfavorable symptoms had subsided and convalescence established. What is the conclusion? Was the diagnosis incorrect, or had there been a seriour pulmonary bacterial invasion that had, from some cause been

suddenly destroyed? Surely the latter is the rational conclusion. The symptoms were too typical to admit of an error in diagnosis. The prominent question before us then is: what destroyed the bacteria? The answer is "high temperature."

Now my friend who prescribes the large dose of sedative medicine will say that he has given an ounce of acetanilid or repeated heavy doses of aconite and other like agents and saw the same results. So have I, but not always; I have seen the same results in a much larger per cent of cases where stimulants were used instead of depressants as well as where nothing at all was given. Why was pneumonia aborted, in some cases, when antipyretics were administered? Answer, either because the temperature was not lowered by the drug or the drug was administered after the high temperature had destroyed the causative bacteria. Had antipyretics been given early enough, the loss of the animal's life would, in all probability, have been the result of the ignorance. I do not mean to say that all drugs that are capable of lowering the heart's action or depressing the heat producing centers are harmful if properly and timely administered. Many such agents have other actions that are readily valuable and may be useful if administered in such a manner as to prevent their heart and heat center depressing effects.

Again heat center depressing agents may be of service after the excessive body heat has destroyed the bacteria and the high temperature is prolonged as a result of the destructive action of the bacteria during their active period.

Refrigerating applications likewise tend to lower the body temperature and may in the early stages be useful, but not by reducing the temperature of the internal organs.

It is well known that during the early stage of pneumonia while the body temperature is high, the surface temperature is often low, usually amounting to a severe chill (the cold stage). If this cold stage can be prolonged by surface refrigeration and a high temperature maintained in the internal organs, the destruction of the bacteria will be more certain.

Likewise a topical application of heat tends to keep the body temperature high, but as soon as the causative bacteria are destroyed, manufacture of toxins ceases and elimination gets rid of the existing product and the heat centers no longer being irritated, the temperature becomes lowered, possibly to normal.

Should the temperature not rise high enough to destroy the bacteria, they continue to destroy tissue, extend the area involved, increase effusion and produce toxins which are disastrous to other organs, prolonging convalescence and predispose to complications.

Oxidation and elimination through the respiratory tract is always impeded in pneumonia, so the first important step in treatment is to place the horse where there is plenty of pure, fresh air, but free from draft, with plenty of sunlight. The body and limbs should be comfortably clothed and cutaneous circulation assisted by frequent rubbing.

Pneumonia cases are far more tractable in the open country stable even in zero weather than in the modern city stable, unless ventilation has received a better consideration than is usual. The same is true with all influenza forms of disease.

One of the most obstinate outbreaks of an influenza type of disease, that I have ever met with, was under circumstances that I think worthy of notice. Some fifteen or eighteen horses were affected and the disease resisted treatment and at the end of twelve days scarcely any progress had been made. I had been seeing the horses in the forenoon in rather warm weather in April, when the stable was open and ventilation good, but for some reason I made my visit on this day after dark and found all the stock housed for the night The stable was a low, tight one, 80 to 100 feet long and built on a hillside. On opening the door at the upper end of the stable, a rush of foul, hot air enveloped me, that was anything but pleasant. On investigation, I found some twenty cows tied in the lower end of the stable which was at least 15 feet lower than the upper end that contained the horses. The animal heat from the cows raised the temperature, the heated air robbed of oxygen, and loaded with animal waste, from respiration of the cows, rushed to the upper end where the horses were quartered and its place taken by pure air from the outside. The cattle breathed pure air and were well, while the horses were compelled to breathe the impure air and were sick. A change to well ventilated quarters was followed by recovery in a very short time.

I have often taken horses from crowded sales stables, where influenza and shipping fever were raging, with very high fever and placed them on the second floor of the same building, where there was plenty of room and sunlight with good ventilation and as a rule the temperature would drop from two to four degrees in twenty-four hours without medication.

Many similar instances could be cited, but I trust these may help to impress upon the minds of my brother practitioners, the importance of good ventilation in treating diseases of the air passages.

Other hygienic measures are also important. Perfect cleanliness, as clean, dry bedding, free from dust, the prompt removal of all fecal matters as well as urine-soiled bedding is very important.

Careful attention should be paid to the diet. During hepatization, breathing is always difficult. Forward pressure from the abdomen on the diaphragm greatly augments the difficult inhalation, hence bulky and slow digesting or fermenting foods are always contraindicated. Hay should be of best quality and fed only in small quantities. Light, easily digested, laxative food stuffs are always in order, but must be fed with judgment. To allow the digestive tract of an animal sick with pneumonia to become distended with ingestia is absurd.

Fortunately the appetite is usually suspended or diminished during such an attack, but not always. Bran mash, properly made from good, clean bran and fed in an iron pail or trough is always to be recommended, but the vessel should be removed, as soon as the horse has ceased to eat, and cleaned with hot water. The feeding of bran mash, or similar food stuffs in wooden boxes or vessels that cannot be removed and cleaned, that absorb the liquid to soon sour, is a bad practice and should be discouraged. Plenty of clear, cold water should be kept where the patient can get to it at will.

It has already been stated that typical, uncomplicated pneumonia rarely, if ever, calls for medical treatment. If such is resorted to, it should be along the line of stimulation. Complications and irregular courses of the disease should be carefully watched for and treated according to their nature.

The kidneys are usually greatly influenced during the various stages of pulmonary disorders; sometimes the quantity of urine secreted is greatly augmented and at other times it is much diminished, but we must remember the quantity of urine passed does not necessarily measure the amount of elimination. A small quantity of urine, having a heavy specific gravity may eliminate as much waste product as a much larger quantity having a low specific gravity.

The kidneys are, perhaps more easily influenced by various conditions in other parts of the body than by any other organs and their action is to be considered more as a symptom than an evidence of renal disease.

Any organ, when stimulated to an excessive effort is more likely to break down under the strain than though it was left to its own course, hence long continued use of diuretics are to be avoided. Digitalis is often administered as a diuretic in the treatment of pneumonia and yet its stimulating action on the renal cells is doubtful and it is not likely to be harmful.

The heart often becomes weak, spasmodic and inefficient under the action of the toxins and a lesser volume of blood is sent to the parts, blood pressure is lowered, which always lessens the renal secretion. Digitalis increases the force of the heart, establishes a long even systole which permits the ventricle to properly fill, hence sends more blood to the parts (blood pressure raised) and the kidneys become active, large quantities of urine are passed, and we speak of the drugs action as diuretic, when the diuresis was really due to the results of the drug on other organs and in this way is not harmful.

Diffusible stimulants are usually helpful and a nice, but inconvenient one is the old time liquor ammonia acetatus, but its bulk renders it too inconvenient for the modern veterinarian.

Camphor meets the same condition and is much more convenient and perhaps meets the needs of the busy veterinarian best in the form of camphorated oil.

Strychnia has for many years been a favorite with the writer in the treatment of all diseases that produce a depressing effect on the nervous system and has been found most useful in treating pneumonia and kindred diseases of the air passages and for convenience and accuracy, I prefer the alkaloid and always use a tablet that is freely soluble in water in doses of from ½ to 1 gr. and repeated from one to six hours per orem.

I have given as much as 40 grains of strychnia sulphate in 40 hours, when it did not appear possible for the patient to live from one hour to the next and be followed by complete recovery, but of course in such heroic medication, one must watch carefully for toxic symptoms and discontinue the agent or reduce the dose at their first appearance and then should only be resorted to when the disease is most severe and a crisis approaching.

As the primary action of the strychnia is stimulation of the spinal centers, its action on other organs is probably due to increased nerve force. Belladonna, by its power to dilate the cutaneous capillaries, is a valuable agent, but I find the best results when giving it in small doses.

Convallaria is a nice, mild heart stimulant, acts more promptly than digitalis and is minus the cumulative action of the latter; hence a safer agent. When given in small doses, it can be continued for a long time and then becomes a heart tonic.

A favorite formula of the writer's in treating all disease, involving the air passages as influenza, shipping fever and pneumonia is as follows:

℞ Strychnia sulphate grs. xii
Ex Belladonna Fl.
Ex Convallaria Fl. aa. drams iv
Aqua qs. to make 1 quart
Sig. One ounce from 1 to 6 hours, according to the severity of the symptoms.

Alcohol is also helpful and may be used to advantage after other stimulants have been used until their efficiency has become doubtful. It should never be given in sufficient doses to cause excessive stimulation, and discontinued long enough to allow a state of depression to follow. When stimulants of any kind are used in the treatment of disease, the object should be to give the drug in small doses and repeat often, so that the stimulation will be even and continuous. It has been demonstrated that the best results are obtained by the administration of one-half to one ounce doses of alcohol every half to one hour as the severity of the symptoms indicate.

Physiologic salt solution administered at, or slightly above, body temperature, in quart doses intravenously is very efficient, when there is danger of heart failure.

Opium and its alkaloids have no place in the treatment of pneumonia. They destroy reflex and obscure symptoms without curative action.

Inhalation of medicated steam has been used by many practitioners as well as by laymen in the treatment of diseases of the air passages, but attains its maximum efficiency in such diseases as pharyngitis, laryngitis, tracheitis, bronchitis and bronchial pneumonia.

When the disease extends beyond the mucosa, the benefits derived are probably only from the systemic action of the drug taken by absorption as its topical action cannot go beyond the mucous surface.

Various methods of volatilization and administration have been resorted to. The most effective method that I have found is one I used in quite an extensive city practice for many years and possibly worth describing. The steam was generated over any kind of convenient fire, as oil or gas stove, or tinner's furnace in a tin vessel 6 to 8 inches across the bottom, tapering up to ¾ of an inch at the top. Two quarts of water was placed in this receptacle, containing the desired amount of medicine to be administered, and placed over the fire to boil. The steam was conducted through 10 or 12 feet of rubber hose fastened on the top of the receptacle and to the bottom of a common grain bag, provided with a wooden bottom to prevent the bag from collapsing. The top end of the bag was held open by a hoop which surrounded the horse's nose and held in place by a strap over the head.

The steaming process was continued for 15 to 20 minutes. The blankets should be previously removed on account of perspiration produced by steaming, then the surface rubbed dry and clothing returned.

I believe this method of treating the class of cases above referred to, has saved the lives of more horses than all the other methods that I have tried.

Any of the antiseptics, anodynes, or mucosa stimulants that are reasonably volatile, may be used as, eucalyptus, phenol, belladonna, aconite, eucamphol, creosote and various coal tar derivatives.

In typical cases of pneumonia where the temperature rises to 105 degrees F. or higher, within 24 hours after the attack, the bacteria are usually destroyed within 24 hours after that height is reached, and the temperature ordinarily falls as soon as the toxins are eliminated, which is usually within three or eight days. If hyperpyrexia is continued beyond this time, febrifuges and refrigerants are indicated, but care in their administration is necessary, lest the force of the circulation be lowered.

For this purpose, a cold application as a sheet, wet in cold water and placed over the body and covered with wool blankets, cold sponging, cold rectal injections, etc., is useful.

Antifebrin, phenacetin and aconite are useful when the individual case and the suited remedy are well selected.

If absorption is retarded, it may be assisted by potassium iodide and tonics. Fowler's Solution in 10 to 20 minim doses five or six times daily, or bryonia alba in doses of 8 to 10 minims every three hours, also helps to stimulate absorption.

Drastic purgatives are contraindicated. The bowel should not be disturbed unless there are special indications for it. Laxative diets, if properly administered, are usually sufficient. In very obstinate cases, where I have found a laxative necessary, I have had beneficial results from oleum lini. It may be given in one ounce doses with a syringe and repeated every hour the same as you would probably administer other medicine.

If the appetite is absent and nourishment is badly needed, gruels, linseed and other teas, instead of water may be used, or milk and milk and eggs may be resorted to.

DETAILS TO BE OBSERVED IN MAKING A TUBERCULIN TEST

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Having observed, in practical experience, a number of conditions that may more or less affect the results of the tuberculin test. I wish to call attention to a number of points often thought to be of minor importance, but which probably are capable of influencing the results to a considerable extent. These remarks are confined, in their application, to tuberculin tests honestly conducted on cattle belonging to owners desiring healthy herds, free from tuberculosis.

Where an animal has given a typical reaction to the tuberculin test, lesions of tuberculosis are usually present, nevertheless the test should be carried on in as careful a manner as possible to avoid rises of temperature from causes other than tuberculin. I have found as a rule that the temperature of animals in poor physcal condition is more easily influenced by abnormal conditions than are those in good condition.

The owner should be notified several days in advance of the test so that he may have the young stock and dry cows in stanch-

ions available for the test. The practice of chasing, driving or otherwise unduly exciting animals before the test, so that the initial temperatures may be influenced, is to be condemned. I have seen cases where this has caused the initial temperature to rise from 102 to 106 degrees, due to the unaccustomed exercise or excitement, or both, thereby rendering comparison of temperatures before and after injection very unsatisfactory.

It is essential that animals, not accustomed to being housed, be stabled a few days prior to the test, in order that they may become quiet and accustomed to their surroundings, and normal preliminary temperatures thus assured. If not possible to take this precaution, it may be found very difficult to accurately pick out the reacting and suspicious animals; for should the preliminary temperatures be from 103 to 104 degrees, reacting animals might be classed as suspicious, pass a retest and be returned to the healthy herd thus establishing new centers of infection, and animals ordinarily classed as suspicious would appear to have passed a satisfactory test; for one could readily refer to the temperature of the previous day which would excuse the slight rise; while the animal if carrying a normal temperature, from 101 to 102 degrees, before injection, would have been classed as suspicious and held for the benefit of a retest. Many owners, and some veterinarians as well, seem to welcome excuses for rises in temperature, in order not to consider animals reactors and therefore diseased. It would be much better for all concerned if the conditions were taken into consideration before the test and the test carried on in a careful manner; reacting animals slaughtered or properly segregated, and the suspicious animals either killed or held for retest.

The animals should be handled as carefully as possible; they should, as a rule, be kept in the stable during the entire test; if turned out to be watered they should be returned to the same stalls to avoid confusion. Moderate exercise, standing or lying under hot sun, may cause a rise of temperature in some animals. The stable should be well ventilated and kept as cool as possible; this is more important on a hot summer day.

A careful physical examination should be made of the entire herd, or at least of any animal showing constitutional disturbance, which should be noted on the chart under the proper heading, in order that they may be taken into consideration in determining the results of the test. Since the owner usually knows the peculiari-

ties of each animal, it is well to discuss with him its condition as to unthriftiness, loss in flesh, coughing, etc.; in this way valuable information may often be secured.

It is of the utmost importance that the animals be in general good health when tested and not suffering from garget, foot-rot, indigestion or any other disease than the one for which test is made. Such diseased conditions may be aggravated during the test and a rise of temperature caused, which might be mistaken for a reaction. If abnormal conditions are found, it is best not to test the animal until fully recovered, rather than proceed with the test and secure results of a questionable nature. Some veterinarians do not adhere to this rule, but proceed to test animals not in a normal condition and then seek to justify the results by attempting to explain the circumstances. This practice is always unsatisfactory to all concerned, not only on account of the suspicion thrown upon the animal, and because the animal, if considered suspicious, must be held for a retest, while if not tested, it might have recovered and could have been satisfactorily tested within a short time.

There is always the possibility of an animal becoming sick the day after injection of tuberculin (not on account of the tuberculin, as some cattle owners continue to think) and therefore it is important that the veterinarian take temperatures until they have resumed the normal, for if an animal shows a temperature of 105 to 106 degrees, even with two to four degrees rise above the previous day, it is not a typical reaction until the temperature has started down, and no doubt animals are occasionally killed and no lesions found in just such instances.

The temperature of the barn or stable in which the animals are housed is an important factor. Should the stalls be in a low, one-story structure with a temberature of 100 to 110 degrees and but little ventilation, one could not expect the animals to have normal temperatures. Should the preliminary temperatures in such a case have been taken on a cool or cloudy day and the temperatures in such after-injection taken under conditions as above, there would probably be a marked rise of temperature in many, if not all, of the animals, and this rise might be mistaken for a reaction. Even the hot sun shining through a window on the back of an animal may cause a rise of temperature. Therefore any pronounced change in temperature of the stable before and after injection of tuberculin should be noted and taken into consideration.

Accurate thermometers should always be insisted upon and they should be checked up prior to the test to see that all are accurate, and any that are not should be destroyed or discarded. It is important that the thermometer remain inserted for a sufficient time, not as in cases I have noticed, merely for 15 to 30 seconds, during which interval opportunity to register properly is not afforded, especially in the case of thermometers which do not register rapidly. To avoid this, it is well to have all thermometers timed, allowing from two to three minutes for each insertion; this is not difficult where five or six thermometers are in use.

The syringe should be in perfect working order; the plunger tight, so that no tuberculin can escape during injection; the needle sharp and a perfect fit; the tuberculin fresh and of standard make.

Relative to initial temperatures, I believe the ideal method is to take preliminary temperatures every two hours for 24 hours before injection of tuberculin, but as this consumes too much time for the ordinary test, three or four temperatures previous to injection are generally considered sufficient. It is advisable, when possible, that one or two of these temperatures be taken in the morning, in order that they may be compared with the temperatures at the corresponding hour of the morning following injection. For instance, if they are taken at the even hour before injection, it would be well to take them at the even hour after injection, for comparison. At least one "feeding temperature" should be included in the preliminary temperatures, if feeding temperatures are to be included the following day, so that the animals may be subject to the same conditions and influences after injection as before.

I believe that cows advanced in pregnancy may be tested reliably if care is used. I do not inject them if I think they will calve during the test. Personally, I would rather test them a few days before calving than a few days after, unless the parturition is a normal one, and the afterbirth expelled promptly (and even then there may be a fluctuation in temperature, especially if there is infection or inflammation). Young animals and those advanced in pregnancy will usually be found to have higher normal temperatures than others.

Apparently estrum does not affect the result of the test, if the animals are left in the stable and not turned out in the yard or field so that they can chase or annoy each other. I have known this

to cause an apparently reacting temperature in a healthy animal. If flies are troublesome, it is worth while to spray the animals occasionally during the test with an effective fly-spray, thereby avoiding possible temperature rise in nervous animals from this cause.

If a calf is running with a cow to be tested, the two should not be separated while the test is being conducted, since this causes some animals to become very nervous and their bawling may excite other animals more or less. Failure to milk at the proper time, (particularly heavy milking animals) may cause a rise in temperature.

As to the size of the dose of tuberculin, I do not believe this is of great importance, if at least 2 c.c. State tuberculin is used. Where animals are frequently injected, larger doses should be used; increased doses will not injure healthy animals in any way, so far as I have been able to ascertain, and I have often given from 4 c.c. to 20 c.c. Apparently the portion of the body used for injection is not of consequence, so long as the injection is made under the skin. I have found the most practical time for me to inject is not later than 6 P. M.; this will give the animals considerable rest the first night and avoids disturbing them the second night, for the test will then be finished not later than 6 P. M. I have noticed that there seems to be a tendency for the temperatures to rise where they are continued through the second evening, more especially if it is hot. By following this plan, it is necessary for the veterinarian to spend only part of one night making the test. If hay is fed in the evening, it gives one a chance to finish the test before it is fed the second night.

Temperatures should be resumed from six to eight hours after injection; it is possible, but not probable, that reactions may begin before this. I believe many of the early high temperatures are due to lack of ventilation in the stable during the night. The temperatures should be continued for at least 24 hours after injection, especially in case of animals previously tested with tuberculin. While reactions have occurred in animals later than this, the percentage is less than one-tenth of one per cent, and therefore not worthy of consideration. The first high temperature of any animal, particularly after injection, should be checked, preferably with another thermometer to avoid mistake.

The animals should be fed and watered regularly during the

test. Green feed, such as corn-fodder, oats or oats and peas, rye, wheat or grass, instead of hay, I believe is safest at the time of test, especially where animals are taken direct from pasture. If hay must be fed, large amounts should not be given, especially to young stock, where it constitutes a large part of their diet, for I have often seen temperatures of young animals, that were in poor condition, rise from two to three degrees, caused by nothing more than a heavy feed of hay; no doubt more accurate results can be obtained by feeding green feed, or sparingly on dry hay during the test. Heavy feeding of large-producing cows, as those in milk tests, on cottonseed meal, gluten, cornmeal, etc., while being tuberculin tested, or just before, may cause indigestion and fluctuation of temperature, and should therefore be avoided, for it is a well known fact that the temperatures under these conditions will often vary considerably.

It is best to have water continually before the cattle during the test, so that they will not drink too much at one time. Where this cannot be done, they may be offered a pail of water several times during the day, just after the temperature is taken, and what little variation results will be adjusted before the next temperature is taken, even if the water is ice cold. If the animals are not accustomed to drinking from a pail and refuse, as is often the case, they may be tempted by adding to the water a handful of bran or some other feed. Large amounts of cold water should not be given in the winter at a time when reaction would ordinarily occur. I have known cases where the temperature has been reduced from two to five degrees where animals were allowed to drink large amounts of cold water.

The animals should be carefully observed after injection of tuberculin, for symptoms of physical reaction, such as lack or loss of appetite, staring coat, drooping of the head, or ears or both, dull eyes and countenance, cold hips, stiffness, diarrhea, suspended rumination, etc. This is often noticeable from two to four hours, and possibly longer, before the rise in temperature. Tuberculous animals may sometimes be detected by the above symptoms where but little or no temperature rise is recorded. I have in mind such an animal which gave most of the above symptoms, where but little or no temperature rise was recorded until the 30th hour after injection, then showing a temperature of 104.6 degrees with a rise of 2.4 degrees above the initial temperature; on post-mortem exam-

ination she showed tuberculous lesions in several different organs; this animal might have been condemned at the 16th hour from the physical reaction shown.

Interpreting the records of a tuberculin test requires considerable skill, for the same chart might not be marked uniformly by two veterinarians of equal experience. It is easy to mark a chart where all the animals have passed the test with practically no rise, or where they give a positive reaction with three or four degrees rise, but where there is but little rise, the temperatures ranging from 103 to 104 degrees with one or two degrees elevation, it is difficult to differentiate between slight tuberculin reaction and disturbance caused by many other conditions, and that is why it is so important to have everything as near normal as possible to prevent these misleading fluctuations in temperature. Where a large percentage of tuberculosis exists in a herd, one may condemn much closer than in the case of a small percentage. If but few or no reactors are found, it is best to retest suspicious cases, but where a large number of tuberculous animals are found in a herd, I believe it best to recommend that the suspicious ones be slaughtered, since most of them will be found tuberculous later. No doubt there would be fewer suspicious animals if more care were used in regard to the minor details while making the test.

It is important that a careful post-mortem examination be made of all reacting and suspicious animals, not only to obtain valuable data for guidance in the future handling of the herd, but to insure confidence in the test, both on the part of the veterinarian and the owner. If reacting animals are slaughtered and no evidence of the disease is found, it is discouraging for all concerned. I believe that the owner should be advised in advance of post-mortem that he is not to expect to see a large amount of tuberculosis in every animal that reacts, but that lesions may be found which are no larger than a pin-head, and these may cause a typical reaction. It should be made clear to him that if he is to rid his herd of tuberculosis, it is important that these animals be removed before they become spreaders of the disease.

If the suggestions made here were followed, much more accurate results would be obtained; fewer reacting animals showing no lesions of the disease would be killed, and what is still more important, fewer tuberculous animals would be left in the herd.

In addition to the careful application of the test, I believe

there should be some means of separation of the animals while in the stable, especially in reference to feed and water; (individual mangers) this would prevent to a large extent the spreading of infection from one animal to another between tests, in case any infected individuals were left in the herd.

MEAT AND MILK INSPECTION WITH REGARD TO PUBLIC HEALTH*

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The above subject is such a broad one that I shall attempt only a brief discussion of meat and spend most of my time upon milk inspection. Meat is considered the most common food, milk the most perfect food. Both are easily contaminated, but as most meat is well cooked before eaten, I feel it becomes less dangerous as the greater part of the bacteria are destroyed in this process. Pork is especially dangerous and should always be well cooked.

Meat should be inspected and we should demand good meat, that is taken care of in sanitary abattoirs and protected from flies and dust in shops. Then let us give it proper care after it is sent in the home.

In selecting milk for home use, from the variety of milks on the market, there are three matters of chief importance to be considered; these are safety, decency and price. Milk is one of the most common means of infection and tuberculosis is probably the most common infection. Milk, as it comes from the healthy cow, is sterile, or nearly so, containing only those organisms which may be present in the milk ducts and sinuses. It receives its contamination from the outside, from the negligence and carelessness of the producer, who uses improperly cleansed utensils, milks with dirty hands, and allows dirt, dust and manure to fall into the pail. The cleanliness of raw milk is measured more accurately by its bacterial contents than in any other way.

Safety in milk should come first and is more important than decency or price. If perfect milk scores 100 points, it would be fair to allow 50 for safety and 25 each for decency and price. No city today feels itself safe unless it possesses a pure water supply.

*Read at the Montana Veterinary Medical Association, Missoula, Mont., January 6, 1917.

Water is a public question and where it is impure, public opinion demands that the municipal authorities take steps to remedy the evil. In like manner the milk supply is a public question and should be controlled by public authorities. In taking control of a milk supply of a town, ideal conditions connot be established at once, but complete control must be approached step by step.

First by installation, at the expense of only a few hundred dollars ($300–$500) for apparatus of a milk laboratory to test milk for bacteria. Such tests can be made by a young man or woman at a moderate salary. They give information as to the condition of milk and show which is clean and which is dirty.

Second by pasteurization, which can be quickly applied to all milk, either by the milk dealer or by the city itself. It at once protects all milk consumers against disease. For the sake of safety it should be required and regulated by municipal authorities.

Third bottling; retail milk should be bottled under sanitary conditions and dipping of milk from retail wagons prohibited.

The fourth and final step is the establishment of definite grades and standards for milk. These relate especially to the sanitary character of milk before pasteurization.

Their object is to identify clean and dirty milk and to label it so that the buyer may exercise choice.

Milk grades are recommended by the commission on milk standards. Their report grades milk in three classes, A, B, and C, with bacterial standards for each.

The milk industry is one of the giant industries. It is close to the pocketbook of practically every farmer and close to the health of the consumer.

Decency distinguishes humans from animals and adds pleasure and appetite to food. Cleanliness contributes most to decency.

Milk may be *safe* because it is boiled, but may be indecent because it is filthy.

Milk should be pasteurized because it kills 99% of bacteria, and no epidemic of disease has ever been traced to pasteurized milk.

Raw milk causes septic sore-throat, typhoid and scarlet fever.

In regard to the susceptibility of children to bovine tuberculosis, it is quite definitely settled that the danger to children from tuberculous milk is very great. Dr. Park, director of the Laboratory of the Board of Health of New York, finds that upward of 300 children die every year from bovine tuberculosis infection.

He estimates that this number amounts to about 12½% of all the fatal cases of tuberculosis in children and adds, "Surely we need no better evidence than that to demand of us the protection of human beings against bovine tuberculosis." Dr. Park also has collected from all parts of the world, statistics as follows:

In adults 787 cases have been examined of which 777 show human infection and 10 show bovine infection. This conclusion leads one to believe that adults are fairly immune to bovine tuberculous infection.

Coming to children from 5 to 16 years of age we have 153 cases, 117 of which were human and 36 of bovine origin. In children 5 years old and under, we have 280 cases, 215 of which were human and 65 bovine. These figures are close to those taken from clinical work in England, from which we get the best information on this subject, namely, that 25% to 35% of fatal cases of tuberculosis in children are due to bovine infection.

These figures do not include the numerous non-fatal cases which produce only more or less severe deformities of the skeleton; hip joint disease, psoas abscesses; enlarged glands of the neck, etc.

The final conclusions to this valuable contribution to our knowledge of the importance of the bovine tuberculosis infection in children are to the effect that nobody can deny the great danger to human health from bovine tuberculosis. It is a black spot on the reputation of our civilization at the present time, to permit this disease to continue to reap a harvest of over 200,000 of our fellow citizens every year.

If the public were thoroughly informed of the dangers, among which tuberculosis is only one of many to which it is exposed, through the use of impure, dirty and infected milk, the demand for milk of approved purity would rise to the magnitude of a concerted national movement, and would sweep all objections and difficulties out of its way.

In closing I will make this summary:

1. Milk is nature's most valuable food product.
2. Milk is exceeded only by corn and beef as a product of the soil.
3. Milk is damaged by dirt and bacteria; decency demands that all milk should be clean:
4. Any clean man can produce clean milk in a dairy.
5. Cleanliness has a market value and market prices should

be based not only on richness in butter fat, but on sanitary character as shown by bacterial tests.

6. Clarification contributes to decency of all milk and the *safety* of raw milk.

7. Pasteurization is positively necessary for *all* milk for the sake of safety. It is the *only* guarantee.

8. Municipal milk control is just as necessary as the control of water supplies. It should include: (a) a bacteriological laboratory for testing milk; (b) pasteurization; (c) bottling; (d) grades and standards.

CLINICAL AND CASE REPORTS

A NEW PARASITE FOR CATTLE. THE LARVAE OF *ERISTALIS TENAX L* (DRONE-FLY)

E. A. Bruce, Agassiz, B. C.

Early in August I received at the laboratory for identification some "worms", with a letter to the effect that they were being passed per vagina by a cow. These were forwarded through the Provincial authorities by a non-graduate licensed practitioner in the Comox district of Vancouver Island. A day or two later I was surprised to receive similar parasites from W. T. Brooks, M. R. C. V. S., Provincial Veterinary Inspector; but upon making inquiries these proved to be from the same case.

Suspecting these parasites to be the larvae of some fly, I forwarded them to Mr. R. C. Treherne of the Dominion Entomological staff, who identified them as the rat-tailed larvae of *Eristalis tenax L*, a Syrphid fly. As these larvae live in liquid manure the interested parties were advised that they were due to dirty quarters, and recommended flushing out the vagina with antiseptics; at the same time I questioned them as to the veracity of their statements regarding the origin of the larvae.

Both the non-graduate and Dr. Brooks wrote me confirming their previous assertions.

History. Grade Ayrshire cow, calved about two months. Barn in which animal was kept, in a filthy condition. Owner had been douching cow (for a vaginal discharge) several times before larvae were seen. Dr. Brooks reports that local examination re-

vealed material resembling inspissated pus in the vagina, also blood stained exudate. The cow had a temperature of 103, and the milk yield decreased greatly, but is now improving, appetite about normal. The parasites when first seen were very active and in spite of antiseptic douches appeared in vigorous shape, the cow, however, improved in appearance.

Biology. The following notes were taken chiefly from "The Syrphidae of Ohio" by C. L. Metcalf:

The *Syrphidae* is one of the largest families of the *Diptera.* They have a distinctive manner of flight which has given them the name of "Hover-flies". *Eristalsis tenax* is known as the drone-fly through its mimicry of the honey bee (*Apis mellifera*), especially of the drone. In form, size, coloration and in the manner in which

Natural size drawing of a larvae by Mr. C. W. Young

it buzzes about flowers, it resembles the bee. The casual observer never distinguishes many of the *Syrphidae* from the *Hymenoptera;* the most striking difference is the presence of 4 wings in the bees and two in the flies. The long appendage seen on the larvae of this fly, and from which it derives its name of "rat-tailed", is a telescopic tube which enables it to get air while living in an aqueous medium. I am unable to find definite data as to the length of the larval and pupal periods of this fly, but judging from that given for allied species, the larval period would be from one to three weeks and the pupal about the same. It appears to be an established fact that two generations occur in the year.

Pathogenesis. Metcalf mentions in his bulletin on the Syr-

phidae of Ohio the following:—"Professor Riley mentioned the sending of *E. dimidiatus* in the larval state by Dr. Compton, of Indiana, who stated that they were passed from the bowels of a young woman; also the recent sending of larvae of *E. tenax* by Dr. J. A. Lintner to whom they had been sent as having been obtained under similar circumstances."—*Ins. Life*, 11, 161, 162.

Dr. Graham-Smith in his book on "Flies in Relation to Disease" mentions in connection with intestinal myiasis that, "In England Austen (1912) has met with * * * one case due to the 'rat-tailed maggot' of *Eristalis tenax*, the drone fly. * * * Cases due to the larvae of all these flies have been reported on the continent".

I am unable to find any reference to invasion of the vaginal cavity by the larvae of *E. tenax* in either man or animals.

In the case reported it would appear that the cow after calving was suffering from a vaginal discharge, this coupled with the unsanitary condition of the stable would afford suitable media for invasion.—*Published by permission of Dr. F. Torrance, Veterinary Director General, Ottawa, Canada.*

INTUSSUSCEPTION OF SMALL INTESTINE OF THE COW

J. N. Frost, Ithaca, N. Y.

The patient was a grade Jersey, twenty months old, small in size and in very poor condition. Owner stated that animal had always been unthrifty and had but very little appetite.

On January 21, 1917 the patient refused feed and water, had colicy pains, strained continually and passed very few soft feces mixed with mucus and blood. The symptoms continued until January 24 when the patient was brought to the clinic. Examination at this time found the patient still straining and passing blood and mucus with slight colicy pains. Contractions of the rumen were absent. Pulse 98 and respirations 26 with the temperature 101.8. Upon rectal examination a firm mass was found, in the right flank, in which the involuted edge of the small intestine could be felt. A diagnosis of intussusception was made and the patient prepared for the operation.

The animal was given, per rectum, one ounce of chloral hydrate in one quart of warm water. A portion of this was rejected by the continual straining. After placing the animal on the operat-

ing table an area, in the right flank, about twelve inches wide and twenty-four inches long was shaved and disinfected with gasoline and tincture of iodine. The line of incision was then anesthetized with cocain solution and the field of operation covered with a sterile gauze. An incision six inches long was then made through the skin, the muscle fibres separated and the peritoneum punctured.

By introducing the hand into the peritoneal cavity the intussuscepted intestine was easily found, because of the firm condition in contrast to the softness of the normal intestine.

The intussuscepted intestine, two feet in all, was drawn through the incision and a pair of forceps clamped on the healthy intestine each side of the diseased portion. The diseased intestine was removed together with a V shaped portion of the mesentery. End to end anastomosis was then performed using two rows of silk intestinal sutures, and the mesentery was drawn together with interrupted sutures of silk.

The exposed portion of the intestine was then washed with warm normal salt solution until active contraction of the intestine had started. The intestine was replaced and the incision sutured with one row of interruptured sutures. The animal was removed from the table and given a drench of aromatic stimulants.

Two hours after the operation the patient drank a small quantity of water and was given a stimulating drench. Pulse 98 and temperature 101.5. From this time on the animal made a good recovery with a gradual return to a normal pulse rate and a good appetite. Two months later the owner reported the animal in better condition than she had ever been before.

CYSTITIS IN THE DOG AND CAT AND TREATMENT

Oscar Schreck, New Haven, Conn

Synonyms—Inflammation of the bladder, catarrh of the bladder, irritable bladder, etc.

Idiopathic inflammation of the bladder is of rare occurrence. It most commonly originates either from traumatic causes or from irritation produced by irritating drugs, such as phenol, turpentine, cantharides, or of poisonous or infected matter, especially if long continued. It is an inflammation of the inner coat of the bladder, which usually spreads to the muscle, around the neck of the bladder and arises under very different circumstances.

The bladder is a musculo-membranous pouch that serves as a temporary reservoir for the urine. The bladder is situated in the pelvic cavity, where it occupies more or less space, according to the quantity of urine it contains and is formed of two membranes which compose its walls, the internal of which is mucous, and the external of which is muscular. Anteriorly, the latter is covered by the peritoneum. When the bladder is empty it is thrown into internal folds or wrinkles. The bladder is well supplied with blood vessels, lymphatics, and nerves. The odor of urine in the bladder is suggestive of ammonia. If turpentine has been given, it will be of a violet odor. The color is yellow to dark yellow or pale when there is a greatly increased amount of urine passed. It is acid in reaction, but an alkaline reaction is generally seen in bladder diseases.

Cystitis may be acute or chronic; I have never seen a case in the dog or cat, but that the history was one of irritation produced by drugs, following accidents, and by extension, (catarrh of the urethra,) or from the pelvis of the kidney to the ureter and thus involving the bladder.

Inflammation from blows or automobile accidents, is seen more often if the bladder is distended, less often if the organ is empty.

Symptoms.—As soon as a few drops of urine collect, they excite so much irritation of the bladder, that the animal makes frequent attempts at micturition, and passes only a small amount at a time. Little by little the urine becomes thick and turbid, accompanied by tenesmus and great suffering. The fluid is generally ejected forcibly or even spasmodically. Bowels more or less constipated, loss of appetite, rise in temperature may be severe, acute cystitis commonly degenerates into the chronic form of the disease, if the cause is not removed, and may be followed by incontinence of urine. In the chronic form, the appetite is generally good, but the animal is of a very irritable, touchy disposition.

Treatment.—Inflammation, or catarrh of the bladder. The treatment in most cases is very simple after the underlying cause is removed, excepting those cases that follow accidents. Drugs indicated in the treatment are, buchu, oil of juniper, linseed tea, boric acid, potassii citrate and acetate, acacia, balsam of Peru, salol, myrrh, and I find that sodii phosphate is the best remedy to restore acidity to the urine. The bowels should be kept open by giving the animal oleum ricini or equal parts of ricini and buckthorn, or saline. I am in favor of the latter. Mucilaginous substances mixed

with food are good, if the animal will eat. I have obtained good results from its use in this manner, (flaxseed, barley water) milk, soup, broth, beef tea, all are very useful. Triticum (dog grass) is to be recommended for its emollient and diuretic action in the treatment of cystitis or irritable bladder. It is to be given in the form of an infusion if possible, hyoscyamine is to be given if there is much pain or spasm, hexamethylenamine has been used by me with the best of results. Of late I have secured the most satisfactory results from the use of the following. Exercise should be allowed but not over-done.

℞

Potasii citratis.....dr. II-ss
Spts. aether nitrosi.....dr. IV
Formine .....dr. I
Tr. hyoscyami .....dr. I
Aquae menth pip .....q. s...oz. III

M.

Sig. ½ to one dram in a little water 4 times a day.

If there is great irritability the following formula is useful for the atonic condition.

℞

Potassii citratis .....dr. V
Potassii bromidi ..... dr. II
Tr. hyoscyami .....dr. IV
Tr. belladonna .....dr. I
Syr. simple .....oz. I
Aqua distil.....q. s. .....oz. III

M.

Sig. One dram 4 times a day.

℞

Fl. Ex. tritici .....dr. II-ss
Tinct. belladonna .....dr. ss
Sodii bicarb .....dr. II

M.

Sig. ½ to one teaspoonful in a little water every 3 or 4 hours.

The above are also useful in the treatment of this disease in the cat, but the dose must be reduced accordingly.

—The Bureau of Animal Industry has established field stations for the eradication of tuberculosis with inspectors in charge as follows: Dr. Roscoe E. Brookbank, Richmond, Va.; Dr. Willis G. Benner, Springfield, Mass.; Dr. Howard E. Smith, Indianapolis, Ind.; and Dr. R. H. Treacy, South St. Paul, Minn.

ABSTRACTS FROM RECENT LITERATURE

MELANOTIC SARCOMA IN A MARE. Prof. E. G. Browne, M. R. C. V. S. *Veterinary Record.*—Aged gray mare, bought for dissecting purposes. She was much emaciated although she had a good appetite and looked generally healthy. She had a swelling under the skin beneath the root of the tail. It was melanotic. She had also a diffuse swelling over the pectoral muscles.

During the dissection, tumors were found extensively distributed the head and neck being the only portion quite free. The lymphatic system was the most extensively involved, very few glands escaping the disease. The lumbar were the most affected. Some formed masses about the size of a child's head. The prepectoral glands were very large and pressing against the axillary vessels. The others were also much diseased. The hepatic and splenic were only slightly affected. Those of the intestines were normal as well as the mesenteric, renal and lower brachial. The heart was apparently normal externally but there was a large cauliflower-shaped growth in the right auricle. The blood vessels were free. The liver had few deposits of melanosis. The spleen, the suprarenal, some of the muscles, principally the abdominal contained melanotic deposits. The lungs were normal. The alimentary canal, pancreas, urinary and genital organs were free. A. L.

ENTAMEBIC DYSENTERY IN THE DOG. S. E. Dowling. *Veterinary Record.*—This appears to be the first on record. The subject was a large deerhound which had been kept in observation for hook worms. He was suffering with blood stained diarrhea and great abdominal pain. The feces, on examination, were found to contain typhozoides. The dog died after eleven days. The post mortem showed the mucous membrane of the colon dotted with innumerable minute red punctate superficial erosions but no large ulcers. Smears always contained entamebae in which at times, red blood cells were seen. The ileum contained hundreds of hook worms but smears of the mucous membrane contained no entamebae although a few were seen in sections on the surface A. L.

MILK FEVER IN A GOAT. S. Smith, M. R. C. V. S. *Veterinary Record.*—It was a goat said to have injured her neck. She was 4 years and 7 months old and giving three quarts of milk a day. She had kidded her third kid, 29 days previously. She was found

by the author quite insensible, unable to stand or even hold up her head. The eyes were glassy, the nose and ears cold and clammy. Temperature normal. Light bloody diarrhea. The udder was inflated; an hypodermic injection of strychnia was given and directions left for fomentations of cold water made to the head. An hour after she showed improvement and in 3 or 4 hours she was up and recovery completed shortly after.

Eclampsia in the Canine Species. Fred C. Mahon, M. R. C. V. S. *Veterinary News.*—After remarks upon the disease, its symptoms, etc., the author presents the following treatment as recommended by Prof. Rouell.

1. The puppies should be taken from the patient and fed artificially until the mother is cured.

2. The bitch should be bled at the saphena vein. The blood will be found to be plastic and readily coagulable, flowing with difficulty, but as it escapes a notable improvement will be observed in the condition of the patient.

3. An ice bag should be applied to the cranium.

4. A hot cataplasm should be put on the abdomen and an enema of tepid glycerine administered.

5. Every half hour a spoonful of broth should be given to which a teaspoonful of the following mixture should be added: Sodae sulphas 15 grams, potass. nitras 5 grams, water 80 and syrup ether 20.

6. Vigorous friction on the spine and limbs.

7. Keep patient in dark room, away from noise and at moderate temperature, about 60°F.

This treatment is said never to fail. A. L.

Equine Scabies in the Mouse. Thomas Parker, F. R. C. V. S. *Veterinary Journal.*—A mouse was observed running along the floor of the stable of mangy horses. Scabs could be plainly seen on its back and ears. She was secured and killed. The tail had been removed and the off hind leg was absent from the stifle downwards. The stumps of these parts were perfectly healed. On each side of the back there was a lesion about ½ inch long, ¼ inch broad and oval in shape. The crusts were yellowish white in color and slightly elevated, exposing blood stained areas at the edges. Each ear had scabs also. The crusts and deep scrapings from the back

were collected and put in a 10 per cent solution of caustic potash. Slides were prepared and examined under low power. Eggs exactly similar to those found on the two mangy horses were recognized and in one slide several parasites. one of them proving to be an adult acarus having all the characteristics of the equine sarcopt.

A. L.

TUBERCULOSIS IN THE HORSE. J. J. Aveston, M. R. C. V. S. *Veterinary Record.*—The author had seen two cases. One in a ten, the other in a 17 year old animal. He tested the two animals with tuberculin. One before the injection registered 101° and after, the highest was 103.7°. The other had 102° at the first injection and 104.3° later. The local reactions were marked in both. The post mortem showed considerable tubercular lesions with caseous degeneration of the splenic and mesenteric glands. One also had slight lesions in the liver. A. L.

BACILLARY WHITE DIARRHEA OR FATAL SEPTICEMIA OF CHICKS AND COCCIDIOSIS OR COCCIDIAL ENTERITIS OF CHICKS. J. R. Beach. *Circular No. 162,* College of Agriculture, Berkeley, California.—The two most prevalent and serious diseases of chicks are bacillary white diarrhea and coccidiosis. Coccidiosis is very often taken for bacillary white diarrhea. Coccidiosis is most prevalent in California. Symptoms and lesions indicating bacillary white diarrhea may be brought about by a variety of causes. A positive diagnosis can be made only by a bacteriological examination of a dead chick. Chicks that recover from the disease harbor the infection either in the ovaries or the testicles. The most common source of infection is hatching the eggs laid by infected hens. Chicks may be infected in contaminated brooders. The course of the disease is rapid as a rule. Mortality averages more than 50%. Preventive measures are most important in controlling the disease. Sour skimmilk or buttermilk are as good as any treatment suggested. They can not be relied upon to check the disease when once started. Preventive measures are hatching eggs from hens not infected and thorough sanitation. Once the disease has entered the flock the sick and dead should be removed and the house cleaned and disinfected. The house should be cleaned every day. The disease may be detected by a bacteriological examination of the eggs or by the macroscopic agglutination test.

Coccidiosis usually infects only the intestines. The ceca are most seriously infected. The age of chicks infected is from two weeks to four months. A bloody diarrhea can be considered positive evidence of coccidial infection. Treatment of the disease consists of sanitary precautions and proper feeding. All birds visibly sick should be isolated or killed and burned. Thorough disinfection and continued cleanliness are essential. Grain and mash should be fed sparingly. Buttermilk or sour milk in large quantities are valuable as a treatment. One teaspoonful of hydrochloric acid per quart of water sometimes gives good results. The sanitary measures indicated and a "buttermilk diet" have proven very beneficial in three outbreaks of the disease. HAYDEN.

LACERATION OF THE STOMACH AND CANCER OF THE PYLORUS IN A MULE. Piot-Bey. *Rec. de Méd. Vétérinaire.*—A twenty-nine year old mule was found ailing. Complete anorexia, abundant salivation, ejection of bloody mucus by rectum, no fecal matter, absolute anuria, conjunctiva much congested, temperature 40°C. rapidly dropping to 37.3°C., cold extremities, pulse almost imperceptible. Death. Post mortem revealed lesions of acute peritonitis with food in the abdomen. The stomach was ruptured in its great curvature from the two cul de sacs to near the pylorus. The organ was dilated. At the extremity of the great curvature and near the pylorus there was a tumor, nearly as big as the fist, irregular on its surface, a little flattened and resisting pressure. The histological examination showed it to be an epithelial cancer. A. L.

ABNORMAL LACRYMAL CANAL IN A HORSE. Marcenac. An army horse presented this anomaly on the right side. There was no nasal canal, the tears ran drop by drop on the meatus situated 3 centimeters below the internal edge of the eye. They passed towards the wing of the nose and left a wide tract of discolored hairs. A second meatus slightly moist, was situated on the superior lip about 2 and ½ centimeters below the lower border of the opening of the nasal fossa.

Dried crusts collected on a level with the meatus concealed its character. A complete cleaning followed by methodic exploration of the ocular globe, and of its annexes demonstrated that the lacrymal canal, subcutaneous in the greatest part of its extent, started directly from the anterior extremity of the gland, that the

superior lacrymal duct was its only affluent and that the two meati were its termination. These meati communicated by a capillary canal sufficient to keep the lower one moist but not to take the part of an excretory canal. A. L.

BURSTING OF AN ABSCESS FOLLOWED BY ACUTE PURULENT PERITONITIS IN A STEER. G. Perrot. *Rec. de Méd. Vétérinaire.*—A steer refused his food. His loins were stiff, the extremities cold, eyes sunken and tears flowing, breathing short, quick and accompanied with moans, pulse small, thready and quick. The steer was almost dying and yet nothing was said to have been observed before this attack. The animal was found dead the next morning. The abdomen was found congested and towards the lumbar region were collected about ten liters of a dark, red liquid with fetid odor. In the thoracic cavity there was, in the right pleural cavity, a collection of sero-bloody fluid and the lung had contracted. There were costal and diaphragmatic adhesions. There were also several little abscesses and one principally which had opened spontaneously in the peritoneum and given rise to the peritonitis.

A. L.

BOVINE TUBERCULOSIS. C. M. Haring. *Circular No. 155*, Agricultural Experiment Station, Berkeley, Cal.—Cattle are the most susceptible of all animals to tuberculosis. Products of cattle are the cause of many cases of human tuberculosis. This is true more often in childhood and infancy. The loss to the state through bovine tuberculosis is very great. Swine infected by means of cattle refuse are another great source of loss. The symptoms in cattle are unthriftiness, loss of flesh, cough, nasal discharge, enlarged glands, hard lumps in the udder, chronic bloating and diarrhea. None of these symptoms can be relied upon with certainty. The cause of the disease is the bacillus of bovine tuberculosis. The bacilli are spread from infected animals by means of nasal or fecal discharges. Animals discharging bacilli in such a way have open tuberculosis. Animals not spreading the organism, yet being reactors, are called closed cases. The disease is of slow development but quite often clean herds will show a large proportion of reactors in a very short time. A herd may be infected by bringing in infected animals, feeding calves with products from tuberculous cattle, showing at insanitary fairs and exhibits, shipping in cars not

properly disinfected, by grazing with diseased cattle or having access to contaminated drinking places. Either the intradermal, the ophthalmic, or the subcutaneous methods may be used in testing. The State Veterinarian of California will use the intradermal test in most cases in enforcing the new dairy law. The combined method should be used in cleaning up a herd having been infected. In this method the ophthalmic test is applied twice at intervals of one week, the second test to be watched with great care. The ophthalmic is followed by the intradermal test. After a lapse of six weeks the subcutaneous method may be applied to animals not having been removed by the other tests. The ophthalmic test may be used occasionally. Herds having reactors should be retested every six months and freed from reactors annually. Reacting cattle should be slaughtered for beef under proper inspection. Bovine tuberculosis is indigenous, is specific and is infectious in nature. These three characteristics should be borne in mind in combating the disease. All reactors, as well as non-reactors showing physical symptoms, should be isolated. The premises should be cleaned and disinfected thoroughly. The ophthalmic test should be applied in two or three months after finding a herd infected. This is to be done twice. All reactors to be removed and premises again cleaned and disinfected. Every six months either the intradermal or subcutaneous test should be used. The author prefers to alternate these tests in semi-annual testing. Any additions to the herd should be tuberculin tested and should come from sound herds. Either the Bang system or the Ostertag system may be used as an aid in suppressing the disease. Cleanliness and plenty of sunlight are necessary sanitary measures. Manure from tuberculous cattle should not be allowed to contaminate drinking places nor should it be worked over by swine. Interiors of dairy barns should be whitewashed twice a year. HAYDEN.

TRAUMATIC PLEURISY. RECOVERY. J. Hamoir and Jules Laleuze. *Revue Generale.*—A twelve year old mare had, on the left side, back and in the upper part of the costal region, a complete external fistula with openings situated at different levels. The lower had fleshy granulations and suppurated little. The upper ones threw out a great quantity of pus. She had also another fistula tract which penetrated into the thoracic cavity, a blind external fistula. Exploration of the intrathoracic pouch gave exit

to abundant pus, very fetid in odor. It was necessary to enlarge the fistula to facilitate the exit of the pus and also permit the manual exploration of the cavity of the pouch. The operation was done with the animal cast, and by a proper incision the fingers and afterwards the whole hand was introduced into the intrathoracic cavity. It was found quite large, about the size of a child's head and contained much liquid and fetid pus. No foreign body was found. The sequelae were very simple and the animal recovered without trouble and without further indications of lesions.

A. L.

ARMY VETERINARY SERVICE

REPORT OF THE COMMITTEE ON ARMY VETERINARY SERVICE*

As soon as war seemed inevitable, most if not all of the technical organizations, such as the National Medical, Dental and Engineering Associations offered their services to the Government, appointed committees and some of them have delegations constantly present in Washington to give advice on technical matters. Following the lead of other societies, President Charles E. Cotton appointed a similar committee to represent the American Veterinary Medical Association, thereby putting the Veterinary Profession in the same rank of patriotic helpfulness to our Government that other National Associations have given to their respective professions. The purpose of this committee was two-fold; first, to assist the Surgeon General in any way possible to insure efficient veterinary service in the Army, and second, to secure if possible higher rank for Veterinary Officers so that they would have authority to do things.

The need of the Government for assistance along veterinary lines was greater perhaps than in any other departments of the Army. Army Veterinarians in accordance with the Act of Congress May 21, 1916, had received their commissions only a few months before, and there were only about fifty-eight veterinarians then in the regular army, with about sixty more to be added from examinations that had been held during the last few months. There

*Presented at the 54th annual meeting of the American Veterinary Medical Association, Kansas City, Mo., August 1917.

will be required for the Army Organizations from 400 to 1,000 more veterinarians that must come from civil life with practically no knowledge of Army conditions or requirements. Should the war be a long one a larger number will be necessary.

Again, the law recently passed giving rank to Veterinarians in the Army, placed the Veterinary Corps in the Medical Department under the Surgeon General. This department naturally was not familiar with the Veterinary situation, and before it had completed the organization of the Veterinary Corps war had been declared.

Much more could be said on this point, but this seems to be sufficient to show how important it was for our profession that President Cotton should have followed the plan of other Technical Organizations. This is a critical time for the profession. If the Veterinarians who go into the Army are not efficient professionally and otherwise, they will check the progress that after years of labor has been started.

March 22d the committee waited upon the Surgeon General. It was told that the Veterinary Officers Reserve could not receive rank above Second Lieutenant under existing law. It was also told that a considerable number of Veterinarians would be necessary for the Reserve, and that it was of the greatest importance that these should be competent men of experience. No plans were made for an enlisted personnel.

About the middle of April the committee again met in Washington. It had a conference with Major G. E. Griffin of the Army Veterinary Corps, Dr. Mohler of the Bureau of Animal Industry and Col. Goodwin, Medical Officer of the English Army. At this time we were requested to present to the Medical Advisory Board recommendations for the Army Veterinary Service. These were based on the experience of the British Army, where all are agreed the Veterinary Service has been the most efficient. At this time it was suggested that an Advisory Board, appointed by the Surgeon General, similar to boards that had already been appointed on the recommendation of other organizations, might be of some assistance.

The Medical Advisory Board, together with the Surgeon General, approved of the recommendations and stated that legislation would be necessary. Our committee was referred to the Legislative Committee of the Medical Advisory Board to ascertain what

should be done to provide necessary legislation. The Legislative Committee thought an amendment could be made to existing law that would give the same rank to the Veterinary Officers Reserve that was granted to the Medical Officers Reserve. In the meantime, the committee secured as much aid as it could from influential men to obtain the approval of the Secretary of War and of the War College for the proposed amendment.

In July the committee again met in Washington with a definite plan for legislation and organization, which met with the approval of the Surgeon General. The committee then waited on the Secretary of War and was told by him that legislation was not necessary to secure the organization recommended, as our request came within the limitations of the Act of Congress of May 18th, 1917, authorizing the President to extend the Military Service during this war.

The statement from the Secretary of War made it necessary for the Surgeon General to plan for securing the necessary rank and organization, and there seemed to be nothing more that the committee could do until the plan presented by the Surgeon General was acted upon by the Secretary of War.

Following this the Surgeon General appointed an Advisory Board of five to assist in organizing the Veterinary Corps, and making recommendations for its operations. This Board has been at work for only a month. Soon after its appointment the Surgeon General issued a statement concerning it.

It should be understood that the function of the Board is advisory only. The Legislative Committee has worked hard and accomplished much in the past but there is still much for it to do before the Veterinary Service can be placed on a just and permanent working basis that compares favorably with similar service of other nations now at war. Every individual member of this association is urged to assist the Legislative Committee in every possible way to obtain what is so much needed at the present time. This means a permanently organized Veterinary Corps in the Medical Department with rank up to and including Colonel and with an enlisted personnel.

We believe that there is still much valuable service that can be rendered by your Committee on Army Veterinary Service. In our opinion the committee should be continued during the present war.

The English Army Council has requested the Military Attache, British Embassy, Washington, D. C., to accept for temporary

honorary Commissions in the British Army Veterinary Corps twenty-five American Veterinary candidates for their service—they must be:

1. American citizens
2. Of pure European descent
3. Under forty years of age
4. Physically fit for service
5. Members of the A. V. M. A.
6. Properly approved as suitable for the service.

Successful candidates will receive the rank, pay and allowance of a first lieutenant. After one year of successful service will be promoted to the rank of Captain.

The amount received is practically the same as is given similar rank in the U. S. Army.

It is hoped that after a full quota of Veteriñarians have been received for our own service, that we may still have a sufficient number of competent men who will gladly comply with the courteous invitation from the British Army.

Any who are interested should correspond with the British Recruiting Mission Officer in Charge, 280 Broadway, New York, N. Y., which will furnish all necessary information in reference to the service.

Committee { C. J. MARSHALL. V. A. MOORE. J. R. MOHLER. D. S. WHITE. L. A. KLEIN.

GOVERNMENT PLANS FOR BIG ARMY OF ANIMALS FOR THE CANTONMENTS HERE AND CAMPS ABROAD

Auxiliary Remount Stations to Be Established at Division Camps Here—Animal Embarkation Depots at Ports From Which Shipment Is to Be Made—Field Remount Stations Overseas to Be Established by Commander Abroad.

1. Under authority conferred by section 2 of the act of Congress "authorizing the President to increase temporarily the Military Establishment of the United States," approved May 18, 1917, the President directs that there be organized for the period of the existing emergency, the enlisted strength being raised and main-

tained by voluntary enlistment or draft, the following organizations of the Quartermaster Corps:

(*a*) For duty at division camps and cantonments in the United States, 33 auxiliary remount depots, each of the following personnel:

COMMISSIONED

Major, Quartermaster Corps	1
Captain, Quartermaster Corps	1
First lieutenant, Quartermaster Corps	1
Second lieutenant, Quartermaster Corps	1
Officer, Medical Corps	1
Officers, Veterinary Corps	6
Total Commissioned	11

ENLISTED

Quartermaster sergeant, senior grade Quartermaster Corps	1
Quartermaster sergeants, Quartermaster Corps	8
Sergeants, first class, Quartermaster Corps	8
Sergeants, Quartermaster Corps	36
Corporals, Quartermaster Corps	13
Cooks, Quartermaster Corps	5
Privates, first class, Quartermaster Corps	91
Privates, Quartermaster Corps	136
Total enlisted	298

Necessary sanitary and veterinary enlisted personnel to be attached.

One additional auxiliary remount depot will be organized for each Regular Army division ordered organized in the United States.

(*b*) For duty at ports of embarkation, one animal embarkation depot of the following personnel:

COMMISSIONED

Captains, Quartermaster Corps	2
First lieutenant, Quartermaster Corps	1
Second lieutenant, Quartermaster Corps	1
Officer, Medical Corps	1
Officers, Veterinary Corps	6
Total commissioned	11

ENLISTED

Quartermaster sergeant, senior grade, Quartermaster Corps	1
Quartermaster sergeants, Quartermaster Corps	5

Sergeants, first class, Quartermaster Corps..	5
Sergeants, Quartermaster Corps	28
Corporals, Quartermaster Corps	11
Cooks, Quartermaster Corps	4
Privates, first class, Quartermaster Corps....	79
Privates, Quartermaster Corps.....	128
Total enlisted	261

Necessary sanitary and veterinary enlisted personnel to be attached.

One additional animal embarkation depot will be organized for each additional port designated for embarkation of animals.

(*c*) For duty in the theatre of operations, one field remount depot, of personnel as prescribed above for an animal embarkation depot. Harness repair shops and wagon repair shops may be attached.

Additional field remount depots will be organized as required at the rate of one to each two combatant divisions in the theatre of operations.

2. Officers for these depots will be provided as authorized by the third paragraph of section 1 and section 9 of the act of Congress approved May 18, 1917.

3. Under the authority conferred by the first sentence of section 2 of the act of Congress approved May 18, 1917, enlisted men of the Quartermaster Corps and members of the Quartermaster Enlisted Reserve Corps selected for these depots will be transferred thereto under authority of this order. Department commanders may transfer to these depots privates of the line who are graduates of a school for farriers and horseshoers. Notation of transfer, and in the case of noncommissioned officers of continuance of warrant, will be made on the individual records of all enlisted men transferred. This authority will not be construed to authorize any enlistment in the Enlisted Reserve Corps in excess of those already authorized.

4. The places at which the animal embarkation depots and field remount depots are to be organized will be designated by the Commander in Chief abroad for such depots abroad and by the Chief of Staff in consultation with the Quartermaster General for depots at home.

5. Regulations governing the organization, administration, and equipment of auxiliary remount depots will be published in

Special Regulations of the War Department. These regulations, in so far as applicable, will govern also in the case of animal embarkation depots and field remount depots.—*Official Bulletin.*

THE SERVICES OF VETERINARY MEDICINE IN THE WAR

EUGENE FRÖHNER

The world-war of to-day has placed important tasks upon veterinary medicine in regard to the treatment of sick horses, the suppression of infectious diseases, and the organization of the military service. The healing art, which during the last few years, through the operation of veterinary and sanitary police, has been somewhat relegated to the background, again comes into its own through the war, apart from internal and surgical diseases of army horses, the infectious diseases acquire great significance. In the forefront stands glanders, which moves from east to west, and threatens the readiness for battle of the German army, as well as the horse-breeding industry. The blood test and the eye test together make it possible, however, to suppress it quickly and surely. By investigations in a horse lazaret for glanders it is now undoubtedly proved that glanders much more frequently heals by calcification of the glanders nodules than has hitherto been supposed.

An invasion from rinderpest and the widely-prevailing parasitic bronchitis in the occupied regions of the north of France should be avoided. Effective measures have also been taken against the piroplasmosis prevailing in Flanders and Macedonia, which is spread by ticks (dermazentor reticulatus). A disease hitherto unknown in Germany and prevailing in Austria and Belgium since the war, known as infectious broncho-pneumonia, which runs an insidious course, and causes a heavy death rate (mortality 12 to 28 per cent.), has been favorably influenced by intravenous injections of sublimate solution—a quite new procedure in the treatment of lung diseases. Protective inoculations against strangles were quite ineffective, but curative inoculations by means of large intravenous doses of serum—as in petechial fever (purpura hemorrhagica)—were often successful. Pernicious anemia appeared several times in Flanders and the North of France. Its spread seems to result

from insect bites or stings as in piroplasmosis. War rations reduced the peace proportion of cases of illness due to overfeeding, and mostly had a favorable influence on the condition of the horses. Hay and straw could be quite well replaced by heather (calluna vulgaris).

Food poisoning in a great number of cases was noticed. Thus intestinal catarrh arose from sugar and molasses poisoning; colic, inflammation of the kidneys, paralysis, laminitis, greasy heels, and other skin diseases coincident with mange were evident. Castor oil poisoning arose from feeding on linseed cake containing ricinus. Characteristic poisonings were brought about by nibbling the untrimmed pine stems from the walls of shelters, and from the taxus shrubs covering the walls of rifle pits. Besides these, white lead poisoning occurred in horses billeted in a white lead factory; copper poisoning after feeding on wheat dipped in blue vitroil; glanders-like nasal ulcers after inhalation of lime in street dust, and similar diseases of the mucous membrane after disinfection of scabies stalls with lime; numerous carbolic, cresol, and petroleum poisonings as the result of the use of impure preparations in the treatment of mange; there were occasional poisonings due to partaking of laburnum, meadow saffron, beech nuts, dogs mercury and atropa. The copper preparation optochin used in human medicine against inflammation of the lungs leads to incurable blindness; its use in veterinary medicine is, therefore, to be adopted with great caution and only subject to daily use of the ophthalmoscope.

Through the war the relations between human and veterinary medicine are closer. The doctor's war surgery has taught the veterinarian a good deal, but human medicine has learnt something from veterinary medicine, especially in the field of diseases communicable from animals to man. Glanders and mange have frequently been transmitted to men, and many a veterinary surgeon has experienced glanders infection. The relation of symptomatic anthrax of animals to the so-called gaseous emphysema of man is to-day clearer among doctors than before.

Medical study at the German universities will in future include a course in veterinary medicine.

The military organization, bad at first, now includes mobile and immobile horse depots and horse lazarets, glanders and mange lazarets, blood examination stations, carcass destructors, etc. Besides the divisional, army, and chief veterinary surgeons, there is

still lack of organizing personnel of the first rank and more especially of an investigator (research conductor) of the highest scientific eminence—a field veterinary chief.—*Swiss Veterinary Journal.* G. M.

Reprinted from the Veterinary Journal.

—Dr. W. H. Lynch of Portland, Me. has been commissioned as Lieutenant A. V. C. and is stationed at Boxford, Mass., with the 103d Regiment Artillery.

—Dr. I. G. Howe of Angelica, N. Y. has been called into the service and, as Second Lieutenant, is stationed at the Camp Hospital at Gettysburg, Pa.

—Second Lieutenant H. P. Flowe of the Veterinary Reserve Corps, formerly of Raleigh, N. C., is stationed at Fort Riley, Kans.

—Dr. L. F. Crane of Naples, N. Y. has received a commission as Second Lieutenant in the Veterinary Reserve Corps.

—First Lieutenant A. L. Mason has been transferred from Fort Reno, Okla. to the Surgeon Generals Office, Washington, D. C.

—Lieutenant Nelson Moffatt of the Veterinary Reserve Corps is stationed at Fort Camp Myer, Virginia.

—Lieutenant A. A. Leibold, formerly of the Chicago Veterinary College, has been ordered into active service at Camp Grant, Rockford, Ill.

—Dr. W. W. Webb, formerly of West Point, Ga., is stationed at the 31st Divisional Headquarters, Camp Wheeler, Macon, Ga.

—Dr. J. C. Hunt, formerly of London, Ohio, is stationed at the Remount Depot, Camp Sheridan, Montgomery, Ala.

—Captain Ray J. Stanclift of Fort Riley, Kansas, has been ordered to report at Washington, D. C.

—Veterinarian Geo. H. Koon has been transferred from the 12th U. S. Cavalry, Hachita, New Mexico to the Remount Station, Fort Bliss, Texas.

—Second Lieutenant Roy M. Morton, formerly of Rockwell City, Ia., is stationed at the Remount Depot at Camp Gordon, Atlanta, Ga.

—Dr. Elmer Jarvis, formerly of Momence, Ill., is stationed at the Remount Depot, Camp Gordon, Atlanta, Ga.

AMERICAN VETERINARY MEDICAL ASSOCIATION

TELEGRAMS TO THE PRESIDENT AND SECRETARY OF WAR

Hon. Woodrow Wilson, President of the United States:

The American Veterinary Medical Association, in convention assembled, places itself and its three thousand members at your command to give and to serve as a body as you may direct.

CHARLES E. COTTON, President.
L. A. MERILLAT, Secretary.

Hon. Newton D. Baker, Secretary of War,
Washington, D. C.

Three thousand veterinarians, members of the American Veterinary Medical Association, in convention assembled, pledge you their unqualified support, in this our nation's greatest hour of peril.

CHARLES E. COTTON, President.
L. A. MERILLAT, Secretary.

Dear Mr. Merillat:

On behalf of my associates, and personally, kindly convey my appreciative thanks to the members of the American Veterinary Medical Association for their generous message of support.

Cordially yours,
NEWTON D. BAKER,
Secretary of War.

RELIEF FUND FOR ALLIED VETERINARIANS

The latest word from Chairman Blattenberg is that the fund has now reached a total of $3,890.

According to information, received from Dr. Liautard, the following contributions have previously been made from America to the Anglo-Franco-Belgian Fund for veterinarians:

Dr. W. H. Dalrymple, Louisiana.....	100.00	francs
Dr. P. A. Fish, New York.....	50.00	"
N. Y. State Veterinary Medical Society..	584.00	"
Montana Veterinary Medical Association.	110.45	"
Mass. Veterinary Medical Association....	137.25	"
Southern Tier Vet. Med. Association.....	283.05	"
	1264.75	francs

This sum is the equivalent of about $253.00.

REPORT OF THE COMMITTEE ON RESOLUTIONS

Patriotic Resolution

Whereas, it is generally recognized that the early successful ending of the war is to a large extent dependent upon the conservation of all resources; and

Whereas, the veterinary profession fully recognizes its patriotic duty along the lines of its appointed services; and

Whereas, the profession can render assistance in the conservation and control of the food supply, protection of human and animal health, be it

Resolved: That the members of the American Veterinary Medical Association, in convention assembled, pledge our best efforts to the United States Government in all efforts for the protection and conservation of the food supply and the relation of human and animal health thereto, as well as in other directions as will best aid the Government in the present crisis; and be it further

Resolved: That a copy of this resolution be forwarded to the Council of National Defense.

Army Resolution

Whereas, our country is engaged in the world's struggle for the survival of democracy and that in the conduct of war, the welfare of domestic animals is one of the essential elements of success, and

Whereas, the well-being of our domestic animals is dependent upon an efficient veterinary service, and further that this service depends directly on the activities of the best veterinary talent of our country; and

Whereas, the most proficient members of our sister profession, that of human medicine, are being commissioned for Army service and in this work they receive the rank which is commensurate with the service rendered; be it

Resolved: That the American Veterinary Medical Association go on record as endorsing the efforts of its Committee on Army Veterinary Service in securing for veterinarians rank in the Army which will gain for this service the most able men in veterinary science in the country and further that the added rank will greatly aid in their efforts to preserve the health of the army animals; and be it

Resolved: That we respectfully ask the Surgeon General and the War Department to grant the requests of this committee for added rank and for the number of veterinarians to properly conduct this work; and further be it

Resolved: That a copy of this resolution be transmitted to the Secretary of War, to the War College, to the Surgeon General, to the Advisory Veterinary Committee on Army Veterinary Service, and also that it be printed in the Records of this Association.

KERN RESOLUTION

Whereas, this body,—the American Veterinary Medical Association, in convention has learned of the death of the Hon. John W. Kern of Indianapolis, Indiana, be it

Resolved: That the profession herewith place on record its sorrow at his death and its expression of sympathy to his family and pays tribute to his helpful services in the Senate of the United States in behalf of the well being of the veterinary profession, and that copies of the resolution be furnished to the family and included in the proceedings of this association.

Committee { J. REICHEL, Chairman. A. EICHHORN. C. G. LAMB. C. P. FITCH. J. H. BLATTENBERG.

SECRETARY'S ANNUAL REPORT—(1917)

The fiscal year which ends with this meeting has been an unusual one from standpoints which I shall present herewith under separate headings:—

RELATIONS WITH THE JOURNAL. This is the first full year of our departure into the publication of a journal and is therefore the first opportunity the association has had to determine the wisdom of this enterprise from the financial point of view. The wisdom or in fact the necessity of establishing a means of communication with the membership oftener than once a year through the publication of an annual report has not been seriously questioned, but the financial success did cause some anxiety among those best acquainted with our resources. Although we sometimes travel near to bankruptcy, the year's work allays some anxiety and gives evidence of good prospects by the safe balance now in the treasury above the current indebtedness.

One of the important tasks of the year was that of creating workable relations between the Journal office and the Secretary's office, and while these are not as yet perfect the new systems we have adopted from time to time are rapidly bringing harmony and efficiency into both. As amicable relations and effectual team-

work between the "collection department" and the "publication department" are actually essential to the life of the association I trust the amity and concord now existing shall continue between our successors.

Plans of reporting to each other changes of address, undelivered mail, deaths, resignations, delinquencies, suspensions and other information of common importance have been worked out and a definite financial system has been adopted, and approved by the Executive Board.

The *Journal* receives one-half of all receipts for dues and initiation fees and these are deposited with the treasurer for the *Journal* as fast as they are received. This fund, augmented by subscriptions from non-members and from advertisements, is drawn upon solely for *Journal* expenses. This money we have called the "Journal Fund", and while it has been sufficient to meet all expenditures of publication and distribution during this year, future officers are warned against following this as a precedent. That is, the *Journal* should be reimbursed from the "Association Fund" to meet the deficits which are very likely to occur during these days of soaring prices. This I recommend especially to show the wisdom of keeping a safe balance in the "Association Fund" as an emergency, instead of spending the whole surplus for enterprises less important than the *Journal*.

COLLECTIONS. On taking over the office August 25th, 1916, only a few of the members had paid their dues for that year. Not having been satisfied as to the action of the association about the raise of the fees from three dollars to five dollars, no bills were sent to the members for that year, and as there were current accounts against the association amounting to about *two thousand dollars* it was evident that the collection of these must be done forthwith. There were seventeen hundred members in arrears. The printing of new bill heads and other stationery, the making out of these accounts and mailing them, our first official activity, began last August and has continued until the present day, and I congratulate the membership on its prompt response as the delinquent list was reduced from *seventeen hundred* to less than *two hundred*. Among these two hundred are included, some resignations, deaths and members whose addresses have been lost. The loss therefore from these inevitable sources is insignificant and speaks well for the loyalty and constancy of the A. V. M. A. veterinarians.

Future secretaries should not fail to send statements annually

just before the meeting in order that their successors may turn their attention to other matters of equal importance, and at the same time keep the delinquent list lower than it was this year on the date the postal regulations compelled us to discontinue their *Journal*. On January 1st, 1917 there were about six hundred that should have been dropped from the subscription list, but President Cotton ruled that owing to the fact these were just receiving their second notices they should be carried until March. This proved to be a wise ruling as the list was reduced to less than four hundred by February 15th, when I sent the list to the Editor. Since February 15th the number has been reduced to 157, as it stands today.

Election of the Executive Board. The third reason why this was an unusual year for the Secretary is found in the fact that the constitution and by-laws adopted at Detroit left the association without an administrative body and commanded the Secretary to proceed at once with the election of the Executive Board by postal ballot. Future secretaries will have an election in but one district annually. This year we were required to elect a member from each of the five districts, among a membership entirely uninformed about this innovation. There were few indeed who understood the change in the method of electing these officers and as a consequence we were swamped with inquiries about its purport when the ballots were distributed, and this increased the work of this particular election.

A nominating ballot enclosed in a circular letter explaining fully the plan of the election and the apportionment of the country into districts was mailed to the members September 27th, 1916 with instructions to return them within the prescribed sixty days. On November 27th a committee appointed by the Secretary and approved by the President counted the ballots and declared the following nominated:—

1st District. George Hilton; F. H. S. Lowry; C. D. McGilvray; F. Torrance; and J. G. Rutherford.

2nd District. S. Brenton; O. H. Eliason; W. Horace Hoskins; L. A. Klein; and D. S. White.

3rd District. C. A. Cary; M. Jacob; A. D. Melvin; J. R. Mohler; and G. A. Roberts.

4th District. J. S. Anderson; W. F. Crewe; J. I. Gibson; C. H. Stange; and L. Van Es.

5th District. R. A. Archibald; W. H. Dalrymple; G. H. Glover; C. F. Keane; and A. T. Kinsley.

The Committee of Tellers consisted of N. S. Mayo, Chairman; A. H. Baker; G. B. McKillip; A. C. Worms; and J. F. Ryan.

On December 6th and 7th these names printed upon a return postal card were submitted to the members for their choice, and with instructions again to return them within the prescribed sixty days. On February 10th, 1917 these ballots were counted by the following committee appointed by the Secretary and approved by the President. The committee consisted of N. S. Mayo, Chairman; L. Enos Day; D. S. Jaffray; G. B. McKillip; J. F. Ryan; and A. C. Worms, and their report was as follows:—

Votes cast in the 1st District, 105; 2nd District, 693; 3rd District, 190; 4th District, 326; 5th District, 292. Total, 1606, and the following were declared elected in their respective districts: F. Torrance, 1st District; W. Horace Hoskins, 2nd District; J. R. Mohler, 3rd District; C. H. Stange, 4th District; R. A. Archibald, 5th District.

As sixty days is not sufficient time for the return of ballots from the Philippine Islands, the installation of Dr. Stange into office was withheld for thirty days, but he was declared elected at that time as the Philippine vote did not change the original count. A repetition of this difficulty is provided against in the amended constitution.

It is evident from this first election that the country is not fairly apportioned. It seems unfair that a district like the 2nd which has nearly half of the membership should have but one representative, and it is recommended that an additional district be made of the states of Ohio, Indiana, Michigan, Illinois and Wisconsin. This would divide the country with a membership about equal with the exception of the 1st which has only about 190 members.

THE MEMBERSHIP. The American Veterinary Medical Association is numerically weak, and while its achievements are commendable we seem to have been devoting too much time to patting ourselves on the back about our greatness without ever stopping to analyze our shortcomings. Its record may be spotless of sins of commission but it is not free from sins of omission. We do not seem to have done all that could have been done toward meeting the requirements of our ever growing live stock industry. We are too often ignored in movements where we should be leaders, and the reason seems to be that we are not constituted of the whole profession. There are about ten thousand eligible veterinarians in this

country and Canada whom we have not interested, who do not pay any attention to our work, and who seem to have no intention whatever of becoming members, leaving the work of maintaining a respectable status for the profession to the paltry two thousand, eight hundred and thirty-three who constitute the membership. Among these ten thousand eligibles are mighty good men, practitioners, officials, and teachers. It has been the custom in the annals of the association to chastise these men for their lack of interest, but I know of no movement that was ever inaugurated to show them the advantages of supporting a national organization, to show them the needs to self, to nation, to profession of maintaining a powerful, nation-wide agency for protective, constructive and educational purposes. To charge these non-members with disloyalty or even apathy is unjust because we find them quite the contrary, taking the liveliest kind of interest in local organizations. When asked point blank why they do not join the national association they invariably reply that they derive more benefit from the local association, that they seldom find it convenient to attend the meetings or that they save two dollars in the subscription to our journal by staying out. These are problems for the future officers of the association to tussle with. They must be solved. Our greatest aim today should be that of creating a desire for membership. We should so popularize the association that every member of the profession would seek admission immediately he enters upon his professional duties. A membership should carry with it some brand of respectability that will conspicuously distinguish the member from the non-member. There is a class of men in the association who unwittingly endeavor to keep the membership ultra-exclusive. I know of no sentiment that is more likely to sound our death knell should it be allowed to prevail than this one. I take it that the American Veterinary Medical Association is for the American veterinarian as we find him today and not for a chosen few. The small practitioner practising ethically away out in the backwoods who maintains his membership year after year without ever finding it convenient to attend a single meeting is the real bulwark because our sphere of influence is too vast to bring together a majority of the members at any one meeting. The loyalty and worthiness of members should not be judged by the number of meetings they have attended, the part they take in discussions or their contributions. A man living in Edmonton, Halifax, Tampa

or San Diego may never find it possible to attend a single meeting and he may not be qualified to present a contribution acceptable to the officers, but he may still be an honored member and should be made proud of his affiliation by some distinguishing decoration for his faithfulness, and supporting influence.

As a point of departure to enlarge the membership along these lines and to inculcate a greater appreciation of a membership I have made certain recommendations to the Executive Board which you shall have the opportunity of either adopting or rejecting. A summary of these is as follows:

A member of three years standing should be given a *certificate of membership,* and all of those members who have joined since the issuing of certificates was discontinued should be favored likewise. This certificate once issued should entitle the holder to use the title of Member of the American Veterinary Medical Association, and to protect the association against the issuance of these certificates to undesirables I would recommend that these be issued only on the recommendation of a local accredited association. When these certificates are issued the member should be made to sign an agreement to surrender it should he be disqualified for any reason thereafter.

We might adopt a plan of electing members at any time of the year, independent of the annual meeting. An applicant recommended by the officers of a local association and the State Secretary of the national association, vouched for by the President of the Executive Board and other officers might become a member at once. In order to guard against secretive action these names could be published for say two or three months in the *Journal* and when objection is made by any member such names can be held over for the action of the association at the next annual meeting. This plan would give the officers an opportunity to work for enlarged membership during the whole year. Now we are blocked with the requirement of a ten-dollar remittance to accompany the application which can not be acted upon until the association meets for its annual convention.

There are few men indeed, even those well situated financially, who would send in a membership application except during the few weeks preceding the annual convention. And as these are the days the Secretary is swamped with other work he finds little time to devote to the one thing that maintains us—the new members to

increase our strength and replenish the losses from the various causes.

It seems absolutely impossible to interest any one in a membership except during July and August and since the Secretary during this period is otherwise engaged a systematic campaign for new members is carried out under difficulties and at the expense of other matters of much importance. On this account I would highly recommend a plan to enlist new members at any time during the year, as is done for example by many other societies situated just as we are.

The following is a report of the members in good standing, the one year delinquents and the applicants:—

Total Members in Good Standing....	2036
One-Year Delinquents	157
Applicants, 1917.....	553
Honor Roll (now abolished).....	58
Honorary Members	29
Total Membership	2833

If we add to these the two-year and three-year delinquents as was customary during previous years the membership would total over thirty-three hundred, but as this custom was abolished by common consent, the number is reduced to twenty-eight hundred and thirty-three. This is a gain of thirty-three per cent in two years. At this rate of increase we should have a membership of five thousand in 1920.

The remarkable increase in membership of certain states like Oklahoma and Arkansas and the entire lack of interest shown by some of the larger states suggests the necessity of selecting wisely the local representatives of the association and the proffer of a helpful hand where interest is waning. These figures lead to the following recommendation:—If the association adopts the plan of seeking approval of the state associations for the applicants for membership, the national association should help these organizations by sending its specialists to their meetings at its expense for educational purposes and to awaken an interest in our aims. At the request of state associations we should willingly defray the expense of good pathologists, surgeons and sanitarians who are willing to go forth into the smaller states to disseminate knowledge which could not very well be otherwise obtained by them. Such an interest would show our unselfish desire to be helpful to these organizations and thus still further cement us to them. The large states having

wealthy associations and located where plenty of talent is available do not need this kind of assistance, nor do those states in which are located veterinary colleges, because the teachers of these schools usually attend the meetings of the associations of their states and thus fill this want. But the struggling veterinarians of states in which there are no colleges and no available talent to help them need such instructions along all lines to keep the practising veterinarians abreast with the times. There is no better work for the A. V. M. A. to undertake than this and I know of no better way of improving our usefulness as an organization.

DELINQUENTS. According to our constitution a member remains in good standing for two years after having failed to pay his dues, but according to the postal regulations we must drop him as a subscriber the moment he becomes in arrears. These two regulations conflict and should be adjusted. We should send the *Journal* to him either during the entire period of his good standing (?) or else pronounce him a delinquent as soon as he is dropped as a subscriber. This provision in the constitution also conflicts with the provision that disfranchises those in arrears. On the one hand we promptly deprive a member of his perquisite (the *Journal*) and his rights, and on the other we put the stamp of approval on his delinquency by pronouncing him in good standing for two whole years. It has been the custom in the past to carry a long list of delinquents in the directory for three or even more years and auditing committee have actually counted these arrears as assets of the association when in fact not a dollar was collectable. Last year for example, the finance report included $2712.00 of unpaid dues, of which we succeeded in collecting less than fifty dollars at an expenditure of probably twice that much. A delinquent who has been appealed to two or three times is more of a liability than an asset. There can be no excuse to carry him on the membership roll. By using loose-leaf ledgers—one page for each member—all these delinquents can be transferred to a separate binder where their records are available for all future references.

OFFICE EQUIPMENT AND METHODS. We have purchased during the year a multigraph at a cost of $217.00, an addressograph for $135.00, a typewriter for $50.00 and a letter file for cross-index filing of letters and documents costing $23.00, bringing the total for permanent equipment up to $425.00. This equipment is of course association property to be turned over to the newly elected

secretary. With these office essentials we have endeavored to put efficiency into the service, to enlarge the usefulness of the secretary to the members and to make a saving on current expenses, for printing and mailing. Without any previous experience we have not done as well with these as it will be possible to do, since having learned how to utilize them for our purpose. The association should employ some steady, faithful person who could operate a multigraph and an addressograph and besides do the bookkeeping and typewriting. Such a person would be invaluable, and if we were fortunate enough to secure one who could take the proceedings of veterinary association meetings here and there for our *Journal* I am sure the investment would be a good one. Thus far we have not been fortunate enough to find the right person for these somewhat miscellaneous duties, and besides the innovation should really be recommended by the association. It seems essential that some sound business tactics be introduced and these must begin by efficient and money-saving office methods. There is an enormous lot of detail to look after since we have undertaken the publication of a journal. A remittance for dues on receipt must be entered into a cash book, it must be posted into a ledger, it must be listed on the bank deposit slip of the Treasurer's bank at Philadelphia, one-half of it must be credited to the *Journal* fund and the other half to the association fund. Then the member must be listed on an information slip for the Editor, and sometimes his address must be changed and finally a card and a receipt must be sent to the remitter. It is very evident to any one having any experience that a well worked out system is needed to prevent the office from being swamped with blunders that bring a full quota of wrathful complaints, and that the system needs a painstaking employee to attend to these details so that the Secretary can devote more time to constructive enterprises. As an example of what work will accomplish you are respectfully directed to the applicants of two of the great states—New York and Illinois. Illinois has 127 while New York has but 2. Note also those of Oklahoma (29) and Arkansas that never had but two or three members which has 21 applicants. These figures are startling. They are startling in that they show that lack of effort on the part of the Secretary's office in any given part of the country has a telling effect. It shows how easy we could sink into insignificance on the

one hand while indicating our potentialities on the other. Can you imagine what a powerful association we would have this very year if every state has increased its membership like Illinois, Oklahoma and Arkansas? The membership would be 5000 instead of 2800.

MEETING OF THE EXECUTIVE BOARD, DECEMBER 16TH, 1916 AT CHICAGO, ILL. The Executive Board was convened on the above date at the request of each member for the purpose of discussing important questions that arose from the adoption of the new constitution. There were present at this meeting:—V. A. Moore, Member at Large, who was selected as Chairman; F. Torrance, 1st District; Jos. Hughes, 2nd District; J. R. Mohler, 3rd District; H. E. Bemis, 4th District; R. A. Archibald, 5th District; President Cotton; Editor Fish; Treasurer Schneider; and Secretary Merillat. The meeting was held in the Secretary's office.

A summary of the actions taken is as follows:—

1. Ithaca was selected as the official home for the *Journal*, which action was made necessary by the postal regulations.

2. The 10th National Bank of Philadelphia was accepted as the official repository for the association's funds.

3. The association's funds were divided into three parts: (a) The Journal Fund; (b) the Association Fund; and (c) the Salmon Memorial Fund, each of which it was ruled must be in this bank in the custody of the Treasurer.

4. All moneys collected from whatever source, applications, dues, subscriptions from non-members, advertisements, sale of books or other supplies were ordered forthwith into the Treasurer's hands, whence alone they could be disbursed.

5. The Editor was allowed a petty cash fund not to exceed $500.00 to meet current expenses and the Secretary was accorded to spend small sums for stamps and office supplies, in lieu of a petty cash fund. Drafts on the Treasurer for these minor expenses must be accompanied with invoices each month.

6. The Editor's salary was fixed at $1500.00 a year; the Secretary's at $1200.00 and the Treasurer was allowed not to exceed $500.00 for clerical expenses.

7. The sum of $500.00 was authorized to be spent by the Legislative Committee to promote the passage of the Lobeck bill, a measure pending in Congress that provided for increased pay for employees of the Bureau of Animal Industry.

8. It was decided that $2.50 of dues should be set aside for the Journal Fund from each member and that $3.00 should be the price of subscriptions from non-members.

9. It having been found impractical to change the fiscal year to January 1st, the Secretary was authorized to retain the old, beginning September 1st, until the by-laws could be changed legally by the association.

THE NEW CONSTITUTION AND BY-LAWS. As the weak points, harmfulness and omissions of such a document can only be determined by experiment, the wisdom of summarily accepting the report of the Committee on Revision at Detroit can hardly be questioned. No matter how much its provisions would have been discussed there would still have been mistakes to reckon with after it had been in operation. It was accepted with this understanding and since changes are in order I beg to submit for your consideration those which seem essential from the viewpoint of this office and which particularly have a bearing upon the secretarial duties:

1. An additional district should be made up of the states of Ohio, Indiana, Illinois, Michigan and Wisconsin.

2. The figures 1914-1915 in article 2, section 5 should be made to read 1915-1916, as these figures disqualify all of the graduates of 1917, an effect I do not believe was intended by the committee. If so intended it is manifestly unfair and should be changed. If it is decided that this was the intent then the Executive Board must scan the applicants of this year for the names of these unfortunate men.

3. A membership certificate with a title concession should be given to all the members of three years standing. A charge to defray the expense of printing, signing and distribution might be made. No certificates should be delivered except on the recommendation of local associations accredited by the association.

4. The matter of issuing Fellowship certificates to men who have retired from professional activities and a time of life when such honors are no longer helpful nor inspiring should be carefully discussed, and if thought prudent younger members for eight or ten years thus honored.

5. The President should be empowered to send, at the expense of the association, teachers, clinicians or lecturers to meetings of local associations on their request.

Bank Deposits

1916			
Sept.	25	.....	$ 1433.35
	29	.....	146.00
Oct.	6	.....	1018.50
	11	.....	844.95
	28	.....	975.50
Nov.	2	.....	218.00
	21	.....	693.00
	30	.....	168.00
Dec.	21	.....	322.25
1917			
Jan.	1	.....	$ 117.00
	8	.....	130.15
	16	.....	148.00
	26	.....	162.00
Feb.	5	.....	136.00
	14	.....	195.00
	20	.....	430.00
	28	.....	275.00
Mch.	15	.....	285.30
	30	.....	446.00
April	10	.....	440.00
	28	.....	385.00
May	28	.....	605.10
June	11	.....	133.00
	11	.....	318.00
	28	.....	323.00
July	16	.....	720.00
	31	.....	543.00
Aug.	2	.....	447.00
	9	.....	1832.00
			$13890.00

Secy's Salary 11 mos...	$1100.00
Dr. Haring	1949.45
Committee Expenses ..	806.98
Treasurer's Expenses..	149.94
Stamps	403.80
State Sec's. Expenses..	171.88
Appropriations	313.61
Office Supplies	395.16
Printing	391.85
Bookkeeper	520.00
Extra Clerical Help...	34.70
Journal	5051.50
Travelling Expenses ..	34.15
Dues returned	10.00
Incidental expenses....	100.92
	$7398.67

Respectfully,

L. A. Merillat, Secy.

Correction. The article appearing in the February 1917 number on "So-Called Staggers in Horses by the Ingestion of *Pteris aquilina* the Common Bracken", the name of E. A. Bruce should have appeared as joint author with S. Hadwen. The name of Dr. Bruce was also omitted, through inadvertence, from the author's index in connection with the article on Anaphylaxis in Cattle and Sheep, etc., which appeared in the April 1917 number.

REPORT OF TREASURER

Receipts from August 2, 1916 to August 6, 1917

1916			
		Balance in bank as per last report	$1,349.06
Aug.	8,	Received from L. A. Merillat, Secretary	1,231.55
Sept.	27,	Received from L. A. Merillat, Secretary	1,433.35
Oct.	2,	Received from L. A. Merillat, Secretary	144.00
Oct.	9,	Received from L. A. Merillat, Secretary	1,018.50
Oct.	16,	Received from L. A. Merillat, Secretary	844.95
Oct.	30,	Received from L. A. Merillat, Secretary	975.60
Nov.	6,	Received from L. A. Merillat, Secretary	218.00
Nov.	24,	Received from L. A. Merillat, Secretary	693.00
		Interest from bank	14.22
Dec.	5,	Received from L. A. Merillat, Secretary	168.00
Dec.	26,	Received from L. A. Merillat, Secretary	322.40
1917			
Jan.	4,	Received from L. A. Merillat, Secretary	68.50
Jan.	11,	Received from L. A. Merillat, Secretary	65.15
Jan.	20,	Received from L. A. Merillat, Secretary	74.00
Jan.	29,	Received from L. A. Merillat, Secretary	81.00
Feb.	8,	Received from L. A. Merillat, Secretary	68.00
Feb.	17,	Received from L. A. Merillat, Secretary	97.50
Feb.	23,	Received from L. A. Merillat, Secretary	215.00
March	5,	Received from L. A. Merillat, Secretary	137.50
March	20,	Received from L. A. Merillat, Secretary	142.65
April	3,	Received from L. A. Merillat, Secretary	223.00
April	13,	Received from L. A. Merillat, Secretary	220.00
May	3,	Received from L. A. Merillat, Secretary	187.00
May	3,	Error in deposit	5.50
May	31,	Received from L. A. Merillat, Secretary	302.55
June	13,	Received from L. A. Merillat, Secretary	174.00
June	14,	Received from L. A. Merillat, Secretary	66.50
June	18,	Cash received for check returned June 9, 1917	5.00
July	2,	Received from L. A. Merillat, Secretary	161.50
July	19,	Received from L. A. Merillat, Secretary	360.00
Aug.	4,	Received from L. A. Merillat, Secretary	271.50
Aug.	6,	Received from L. A. Merillat, Secretary	223.50
		Interest received from bank	37.05
		Total receipts	$11,599.03
		Total expenditures	9,330.68
		Balance in bank	$ 2,268.35

Disbursements from July 22, 1916 to July 23, 1917

1916			
July	22,	Leterer, Street and Zeus, circulars and application blanks	$ 68.00
July	22,	William G. Gregory, refund journal subscription	3.00
Aug.	2,	Dr. R. Donaldson, refund journal subscription	3.00
Aug.	10,	Henry B. Wescott, expense and postage as Resident Secretary of Maine	1.10
Aug.	10,	Dr. E. A. Cahill, expense as Resident Secretary, Boston, Mass	9.76
Aug.	10,	Dr. J. R. Fuller, expense and postage as Resident Secretary, Weiser, Idaho	.50
Aug.	10,	Dr. J. A. Wolcott, expense as Resident Secretary, Madison, Wis.	2.41
Aug.	10,	Dr. A. C. Farmer, expense as Resident Secretary, Berlin, N. H.	1.50

Aug.	10, Dr. J. A. Jervis, expense as Resident Secretary, Vancouver, B. C.	1.32
Aug.	10, A. J. Tupa, stenographer for Tubercular Commission	11.00
Aug.	10, Dr. A. T. Gilyard, expense as Resident Secretary, Waterbury, Conn.	1.64
Aug.	10, Dr. H. C. Simpson, postage and telegrams as Resident Secretary, Denison, Iowa	15.00
Aug.	10, The Multigraph Letter Co., Multigraphing, etc.	90.29
Aug.	10, Dr. J. H. Burt, expense as Resident Secretary, Manhattan, Kans.	2.00
Aug.	10, Dr. Geo. E. Hilton, expense as Resident Secretary, Ottawa, Canada	7.64
Aug.	10, Dr. J. F. McKenna, expense as Resident Secretary, Fresno, Cal	10.00
Aug.	10, Dr. H. Preston Hoskins, expense as Resident Secretary, St. Paul, Minn	8.29
Aug.	10, Dr. C. P. Fitch, expense as Resident Secretary, Ithaca, N. Y.	4.90
Aug.	10, Dr. O. M. Norton, expense as Resident Secretary, Greenville, Mass.	2.12
Aug.	10, Dr. Robt. Graham, expense as Resident Secretary, Lexington, Ky.	1.52
Aug.	10, Charles P. MacLafferty, 8000 letter heads	43.90
Aug.	10, Lederer, Street & Zeus, notices and circulars	23.25
Aug.	10, Dr. W. W. Webb, expense as Resident Secretary, Auburn, Ala.	4.00
Aug.	10, Agents of the University of California, services of stenographer, Division of Veterinary Science	42.50
Aug.	10, Mrs. C. M. Wiggs, clerical services,	25.00
Aug.	10, Dr. O. W. Kerr, refund journal subscription	3.00
Aug.	10, Dr. E. E. Craig, refund journal subscription	3.00
Aug.	14, Dr. C. M. Haring, expense, etc., as Secretary, April 10 to August 3, 1916	424.21
Aug.	14, Dr. N. S. Mayo, expense, postage as Secretary, Committee on Intelligence and Education	7.71
Aug.	14, Dr. A. T. Sigler, expense as Resident Secretary, Indiana	3.00
Aug.	19, Bertram D. Conley, cash advanced reporting Detroit meeting	75.00
Aug.	23, Dr. J. N. Frost, expense as Librarian	60.43
Aug.	23, Dr. L. A. Merillat, expense as Resident Secretary, Illinois	13.50
Aug.	25, Dr. T. F. Krey, Secretary, local Committee on Arrangements for rent of Board of Commerce Auditorium, Detriot, Mich.	35.00
Aug.	31, Hollis, Tilton & Porte, auditing books of Treasurer and Editor	50.00
Sept.	8, Clement Relnhofer, membership fee of rejected application less subscription price of journal	7.00
Sept.	8, Oliver D. Chidester, membership fee of rejected application less subscription price of journal	7.00
Sept.	8, George I. Rhea, membership fee of rejected application less subscription price of journal	7.00
Sept.	8, Braxton M. Weston, membership fee of rejected application less subscription price of journal	7.00
Sept.	8, Hudson Chadwick, membership fee of rejected application less subscription price of journal	7.00
Sept.	8, Dr. W. Horace Hoskins, expense, Salmon Memorial Fund	50.07
Sept.	8, Upton Harrison Stuart, membership fee of rejected application less subscription price of journal	7.00
Sept.	8, Dr. J. H. Blattenberg, expense as member of Committee on Reorganization	12.50
Sept.	8, Dr. P. A. Fish, expense as member of Committee on Reorganization	15.50

Sept.	8,	Dr. M. H. Reynolds, expense as member of Committee on Reorganization	33.50
Sept.	8,	Dr. Tait Butler, expense as member of Committee on Reorganization	26.50
Sept	11,	Dr. L. A. Merillat, expense in connection with section on practice	10.00
Sept.	11,	Dr. Harry S. Gamble, expense as Resident Secretary, D. C.	.52
Sept.	11,	Dr. W. G. Chrisman, expense as Resident Secretary, Virginia	2.50
Sept.	11,	Dr. C. A. Cary, expense as member of Committee on Reorganization	32.80
Sept.	11,	Dr. W. Austin Ewalt, expense as Resident Secretary, Mich.	20.00
Sept.	11,	Dr. C. A. Cary, additional expense as member of Committee on Reorganization	14.00
Sept.	11,	Dr. C. A. Cary, bill dated March 3, 1916, stamps used by Committee on Reorganization and stenographic services	12.00
Sept.	11,	Dr. M. H. Reynolds, bills incurred at Detroit for stenographic work in connection with International Tuberculosis Committee	1.45
Sept.	25,	Lederer, Street & Zeus, wrappers and twine	2.50
Sept.	25,	Dr. S. Sisson, expense as Resident Secretary, Ohio	2.88
Sept.	25,	Dr. F. H. Schneider, expense of Treasurer's office including Hosbach-Mossis' stenographer, printing report, telegrams and stamps	55.16
Sept.	25,	Multigraph Letter Co., printing and addressing letters	13.54
Sept.	25,	Dr. A. Eichhorn, postage and stenographic work required on Committee on Glanders and Journal	12.76
Sept.	29,	Dr. P. A. Fish, salary as Editor of journal, August	100.00
Sept.	29,	Dr. P. A. Fish, salary as Editor of journal, September	100.00
Oct.	4,	Robert W. Ellis—	
		Note due October 1, 1916 $500.00	
		Interest on note paid, July 1, 1916 22.50	
		Six months unpaid interest on note paid April 1, 1916 15.00	
		Interest on note due October 1, 1916 30.00	
			567.50
Oct.	7,	Dr. W. Horace Hoskins, one-third total appropriation of $300.00 for Salmon Memorial	100.00
Oct.	7,	Dr. C. M. Haring, expense of Secretary's office	388.72
Oct.	11,	Marshall-Jackson Co., stationery	216.40
Oct.	11,	Dr. L. A. Merillat, expense as Secretary, September	109.60
Oct.	11,	Checks not properly endorsed, Anderson, Indiana, Canadian postal order	10.00
Oct.	14,	Dr. P. A. Fish, estimated expense of journal office, October	300.00
Oct.	16,	Dr. P. A. Fish, money advanced for cablegram sent to Dr. Liautard, Paris, France	5.00
Oct.	22,	Ethel Dunn, salary as Assistant Secretary, hired by Dr. Haring at Detriot, 5 days at $5.00	25.00
Oct.	25,	Dr. S. H. Howard, refund of application fee, application lost and not acted upon at annual meeting	10.00
Oct.	25,	Daniels and Company, printing 100 membership cards	6.25
Oct.	25,	Harless & Co., premium on bond of Dr. L. A. Merillat, Secretary	17.50
Oct.	25,	M. M. Rothschild, mailing, stamping, printing, addressing and inserting enclosures of letters incident to nomination of candidates for office of district members of Executive Board	50.70
Nov.	6,	United States Fidelity and Guarantee Co., premium on bond of F. H. Schneider, Treasurer	2.50
Nov.	6,	Keir Letter Co., writing and addressing letters	5.25
Nov.	6,	Dr. P. A. Fish, salary as Editor of journal, October	100.00
Nov.	6,	Dr. L. A. Merillat, expense of Secretary's office, October	95.48

Nov. 6,	Dr. C. M. Haring, balance of salary and incidentals	101.15
Nov. 14,	George Donaldson, balance due for stenographic work at Detroit meeting	196.65
Nov. 20,	Dr. P. A. Fish, expense of journal office, November, 1916	400.00
Dec. 16,	Dr. P. A. Fish, unpaid salary for September and October and salary for November	175.00
Dec. 16,	Dr. L. A. Merillat, expense of Secretary's office, November	118.30
Dec. 16,	M. H. Reynolds, typewriting report	.50
Dec. 16,	Dr. P. A. Fish, expenses incurred attending meeting of Executive Board	41.23
Dec. 16,	Wm. Whitford, reporting and transcribing Executive Board meeting	108.00
Dec. 26,	Journal Fund of American Veterinary Medical Association	1,050.15
Dec. 26,	F. H. Schneider, expenses incurred while attending meeting of Executive Board and clerical expenses for September, October and November	129.54
1917		
Jan. 1,	Dr. L. A. Merillat, salary as Secretary, September and October, 1916	200.00
Jan. 2,	Magnus, Flaws and Co., letter heads and envelopes	125.00
Jan. 4,	Error in dividing funds	10.00
Jan. 2,	Dr. D. McCuaig, duty on stationery of Provincial Secretary	1.28
Jan. 11,	British Foreign Exchange	.13
Jan. 12,	Dr. L. A. Merillat, expense as Secretary, December, 1916	75.95
Jan. 12,	Dr. S. J. Walkley, incidental expenses incurred in the legislative campaign in behalf of the Lobeck Bill	83.67
Jan. 29,	Journal Fund, to correct error in not dividing deposit of December 26, 1916	161.20
Feb. 9,	Dr. L. A. Merillat, salary and expenses as Secretary, November and December, 1916	266.45
Feb. 9,	American Multigraph Sales Co., second and third installment on multigraph	30.74
Feb. 17,	Dr. S. J. Walkley, expenses incurred in furnishing information to members of Congress regarding the Lobeck Bill	73.88
Feb. 24,	F. H. Schneider, office expense as Treasurer during December, 1916 and January, 1917	44.79
March 5,	Dr. S. H. Ward, expenses incurred as chairman of the Committee of Intelligence and Education	99.92
March 5,	Dr. N. S. Mayo, expense incurred as member of Committee of Intelligence and Education	49.64
March 8,	Dr. S. J. Walkley, expense incurred in furnishing information to members of Congress regarding the Lobeck Bill	69.48
March 12,	Dr. L. A. Merillat, salary and expenses as Secretary for January	174.80
March 26,	American Multigraph Sales Co., third installment on multigraph	16.18
March 26,	Dr. G. A. Roberts, expenses incurred investigating Alabama Polytechnic Institute for the Committee on Intelligence and Education	37.85
April 6,	Dr. George H. Hart, expenses incurred as a member of the Committee on Intelligence and Education	42.70
April 6,	Dr. L. A. Merillat, salary and expense as Secretary for February and March	348.00
April 10,	Dr. W. J. Stewart, expense incurred in inspecting San Francisco Veterinary College for the Committee on Intelligence and Education	1.50
April 14,	American Multigraph Sales Co., fourth installment on multigraph	16.11

April 14,	Dr. S. J. Walkley, incidental expenses incurred in furnishing information to members of Congress regarding the Lobeck Bill, Hitchcock Bill, Lewis Bill and Lobeck House Resolution	104.73
April 14,	Dr. N. S. Mayo, expenses incurred inspecting Veterinary College for the Committee on Intelligence and Education	72.85
April 14,	Norton Printing Co., printing 500 copies of report of the Committee on Glanders	8.25
April 16,	F. H. Schneider, office expense as Treasurer during February and March	41.66
April 24,	Mrs. J. H. Claus, remembrance, funeral of Otto G. Noack.	10.00
April 24,	Dr. Louis A. Klein, expenses incurred inspecting U. S. College of Veterinary Surgeons and the George Washington University Veterinary College	13.10
May 16,	Dr. L. A. Merillat, salary and expense as Secretary for April	224.70
May 22,	Marshall-Jackson Co., printing and office supplies	40.00
May 22,	American Multigraph Sales Co., fifth installment on multigraph	15.08
June 7,	Dr. L. A. Merillat, salary and office expenses as Secretary for May	324.00
June 8,	Check returned from bank	5.00
June 26,	Dr. N. S. Mayo, expense incurred attending meeting of the Army Service Committee	60.20
June 26,	American Multigraph Sales Co., sixth installment on multigraph	15.01
June 26,	American Journal of Veterinary Medicine advertising	25.00
June 26,	Dr. R. C. Moore, expenses incurred as a member of Committee on Intelligence and Education	103.45
June 26,	Miss M. E. Petty, services	26.00
June 26,	The Modern Press, printing	19.65
June 26,	Marshall-Jackson Co., printing	14.25
June 26,	Check returned from bank	30.00
July 23,	Dr. L. A. Merillat, salary and expense as Secretary, June.	188.13
July 23,	American Multigraph Sales Co., seventh installment on multigraph	17.44
July 23,	S. J. Walkley, expenses incurred in promoting the Lobeck Classification Bill	25.33
July 23,	F. H. Schneider, office expense as Treasurer, April, May and June	63.49
April 16,	Check returned from bank	5.00
	Total expenditures	$ 9,330.68

NOTE

The following checks not returned from bank:

Aug. 7,	Dr. L. A. Merillat, salary and expenses as Secretary, July	$271.65
Aug. 7,	Stickney and Montague, addressograph and equipment	135.26

JOURNAL FUND OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION

RECEIPTS FROM DECEMBER 26, 1916 TO AUGUST 6, 1917

1916		
Dec. 26,	Money from Fund of American Veterinary Medical Association	$1,050.15
Dec. 28,	Money received from Dr. P. A. Fish	900.00
1917		
Jan. 4,	Deposit check from Dr. P. A. Fish	293.89
Jan. 4,	Deposit half from American Veterinary Medical Association, money received from Mr. Merillat, January 4, 1917	68.50

Jan. 11,	Deposit	65.00
Jan. 20,	Deposit	74.00
Jan. 29,	Deposit	242.20
Feb. 6,	Deposit	804.61
Feb. 8,	Deposit	68.00
Feb. 17,	Deposit	97.50
Feb. 23,	Deposit	215.00
March 5,	Deposit	647.68
March 10,	Deposit	142.65
April 3,	Deposit from Fund of American Veterinary Medical Association	223.00
April 6,	Deposit March receipts from Dr. P. A. Fish	685.29
April 13,	Deposit from Fund of American Veterinary Medical Association	220.00
May 3,	Deposit from Fund of American Veterinary Medical Association	187.00
May 3,	Error in deposit	5.50
May 4,	Check received from Dr. P. A. Fish for deposit	659.53
May 31,	Deposit from Fund of American Veterinary Medical Association	302.55
June 6,	Deposit received from Dr. P. A. Fish, Editor of journal	342.95
June 13,	Deposit received from Fund of American Veterinary Medical Association	174.00
June 14,	Deposit received from Fund of American Veterinary Medical Association	66.50
July 1,	Deposit from Fund of American Veterinary Medical Association	161.50
July 11,	Deposit from money received from Dr. P. A. Fish	504.47
July 19,	Deposit half from Fund of American Veterinary Medical Association	360.00
Aug. 4,	Deposit from Dr. Merillat	271.50
Aug. 6,	Deposit from Dr. P. A. Fish	403.21
Aug. 6,	Deposit from Dr. Merillat	223.50
	Interest from banks	12.83
	Total receipts to August 7, 1917	$9,472.51
	Total expenditures to August 7, 1917	7,697.99
	Balance in bank	$1,774.52

EXPENDITURES FROM DECEMBER 28, 1916 TO AUGUST 7, 1917

1916			
Dec. 28,	Norton Printing Co.—		
	Printing 3400 journals for December	$535.20	
	Reprints for October and postage as per attached invoice	30.99	
	Printing cards and advertising contracts and inserting journals for mail	13.80	
			$579.99
Dec. 28,	Ithaca Realty Co., premium on bond for P. A. Fish		7.50
1917			
Jan. 2,	Dr. P. A. Fish, petty cash for administration of journal of American Veterinary Medical Association		500.00
Jan. 2,	F. H. Schneider, pay for office expenses for September, October, November and December		83.32
Jan. 4,	Error in dividing funds		10.00
Jan. 12,	F. H. Schneider, bill for letter files and index book purchased from Yeo and Lukens		4.35
Jan. 12,	A. P. Fish, salary for December, 1916		50.00

Jan. 12,	Norton Printing Co., printing 3400 extra edition journals, A. V. M. Assn., December 15, 1916. Reprints regular December issue. 10,000 envelopes for journal. Insert for mail extra edition	615.24
Jan. 12,	Dr. P. A. Fish, salary as Editor, December, 1916	125.00
Jan. 29,	Norton Printing Co., printing January number of journal, inserting and mailing journals	396.35
Feb. 12,	A. P. Fish, clerical work for January, 1917	50.00
Feb. 12,	F. H. Schneider, one-half salary for January, 1917	20.83
Feb. 12,	Dr. P. A. Fish, salary January 1 to January 31, 1917	125.00
Feb. 17,	Norton Printing Co., 3400 copies of journal, A. V. M. Assn. for February, reprints, inserting and mailing	559.36
March 8,	Dr. P. A. Fish, salary as Editor for February	125.00
March 8,	A. P. Fish, salary for February	50.00
March 12,	F. H. Schneider, one-half February salary	20.83
March 14,	Norton Printing Co., March issue of journal	664.47
April 7,	Dr. P. A. Fish, salary as Editor for March	125.00
April 7,	A. P. Fish, salary for March	50.00
April 7,	F. H. Schneider, salary for March	20.83
April 14,	Norton Printing Co., 3200 copies of journal of A. V. M. Assn. for April, inserting for mail less 200 copies, reprints and envelopes	601.61
May 1,	F. H. Schneider, salary for April	20.83
May 1,	P. A. Fish, salary as Editor for April	125.00
May 1,	A. P. Fish, salary for April	50.00
May 12,	Norton Printing Co., May issue of journal	615.00
June 7,	Dr. P. A. Fish, salary as Editor for May	125.00
June 7,	A. P. Fish, salary for May	50.00
June 7,	F. H. Schneider, salary for May	20.83
June 21,	Norton Printing Co., 3200 copies June number, inserting reprints, etc.	703.76
June 26,	Dr. P. A. Fish, for petty cash fund	438.22
July 11,	Dr. P. A. Fish, salary as Editor for June	125.00
July 11,	A. P. Fish, salary for June	50.00
July 11,	F. H. Schneider, salary for June	20.83
July 26,	Norton Printing Co., printing July number, reprints and inserting for mail	568.84
	Total expenditures to August 7, 1917	$7,597.99

NOTE

The following checks have been issued not returned from bank:

Aug. 7,	A. P. Fish, salary, July	50.00
Aug. 7,	Dr. P. A. Fish, salary, July, as Editor	125.00
Aug. 7,	F. H. Schneider, salary, July	20.83

Dr. F. H. Schneider, Treasurer,
Philadelphia, Pa.

Dear Sir:

The following is a report of the condition of the accounts of the American Veterinary Medical Association and Journal Fund of the American Veterinary Medical Association, as of August 8, 1917:

American Veterinary Medical Association, balance	$2268.35
Journal Fund of the American Veterinary Medical Association, balance	$1774.52

Assuring you of our willingness to be of service to you, we remain,
Yours respectfully.

J. F. BAUDER, Cashier,
Tenth National Bank
Broad and Columbia Avenue
Philadelphia.

NOTE

From August 1, 1916 to December 31, 1916 the expenses of the Journal were paid by the editor, and the following summarized report is appended to supplement that of the treasurer:

P. A. FISH, Editor.

RECEIPTS AUGUST 1 TO DECEMBER 31, 1916

Balance on hand August 1	$ 810.57
Subscriptions, advertisements, etc.	2,335.50
Received from treasurer	700.00
	$3,846.07

EXPENDITURES AUGUST 1 TO DECEMBER 31, 1916

Printing Journals, miscellaneous, etc.	$2,652.18
Remitted to treasurer	1,193.89
	$3,846.07

MEMBERS IN ATTENDANCE AT THE KANSAS CITY MEETING OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION

Alabama—Cary, C. A.; Endsley, W. L.; Meadors, W. H.; Sugg, R. S.; Webb, W. W.; Wilson, H. C.

Arkansas—Boxmeyer, R. E.; Davis, W. L.; Gow, R. M.; Knowles, V. W.; Meixel, E. J.; Noffsinger, C. H.; Puckett, Hugh; Stanford, J. F.; Wight, A. E.

California—Archibald, R. A.; Cady, B. J.; Haring, C. M.; Sorensen, A. I.; Traum, J.; Tyler, John L.

Colorado—Glover, Geo. H.; Lamb, Chas. G.; Morgan, O. B.; Newson, I. E.; Savage, A. J.; Schumacher, Wm.

District of Columbia—Kiernan, J. A.; Miller, A. W.; Mohler, J. R.; Ward, A. R.; White, T. P.

Georgia—Scott, W. A.

Illinois—Abercrombie, H. E.; Adams, Franklin; Aulgar, H. W.; Baker, A. H.; Bennett, S. E.; Bott, A. E.; Brownlee, W. F.; Campbell, D. M.; Eagle, R. F.; Foster, T. J.; Frazer, Chas.; Glendenning, C. G.; Hernsheim, J. T.; Hollister, L. W.; Hughes, Joseph; Johnson, H. R.; Keehn, W. G.; Kempf, S.; Kincaid, A. R.; Kroener, C. O.; Lichty, W. W.; McKillip, Geo. B.; Mair, A. M.; Marks, D.; Mayo, N. S.; Merillat, L. A.; Michael, W. R.; Morgan, W. J.; Nattress, J. T.; Nesbitt, R. E.; Parker, E. B.; Peters, A. T.; Pottle, G. L.; Quitman, E. L.; Rasmussen, J. C.; Schwarze, H. R.; Schultz, H. C.; Sisk, D. E.; Smith, A. W.; Taylor, C. H.; White, C. A.; Zell, C. A.

Indiana—Armour, Wm. J.; Bolser, F. A.; Brown, F. H.; Cooper, Edw.; Craig, W. B.; Julien, R. C.; Kannal, H. J.; Kigin, L. C.; Nelson, A. F.; Newgent, O. C.; Northrup, L. E.; Olson, L. E.; Ramsey, S. V.; Reardon, John D.; Roberts, G. H.; Sharp, C. E.; Sigler, T. A.

Iowa—Asquith, W. L.; Baxter, C. E.; Bell, H. W.; Bemis, H. E.; Bergman, H. D.; Betts, R. S.; Bossenberger, W. P.; Brashier, E. S.; Bronson, W. W.; Byerrum, R. O.; Carson, Geo. M.; Drown, F. A.; Ellis, P. L.; Frank, J. E.; Freed, O. F.; Garrett, S. B.; Gibson, J. I.; Graham, L. B.; Griffith, J. W.; Grossman, J. D.; Guard, W. F.; Himmelberger, L. R.; Hazlet, S. K.; Jessen, J. A.; Johnson, G. A.; Juhl, C. E.; Koen, J. S.; Kulp, A. I.; Leith, T. S.; Lichty, J. M.; Likely, C. W.; Lowes, G.; Lovesee, R. G.; Lueth, J. A.; McElyea, L. W.; McFarland, C. M.; McIntire, H. A.; Middleton, A. C.; Murphey, H. S.; Nelson, N. L.; Oldaker, C. B.; Readhead, W.; Repp, N. M.; Rice, C. D.; Robinson, V. J.; Schoenenberger, J. G.; Scott, C. J.; Sevenster, John; Shipley, T. A.; Simpson, Hal C.; Stewart, H. L.; Stouder, K. W.; Stange, C. H.; Teague, B. B.; Thomson, J. F.; Treman, H. B.; Wall, R. D.; Williams, Geo. M.; Willey, L. E.; Wood, A. L.

Kansas—Bassler, C. E.; Blanchard, G. I.; Bronson, R. A.; Burdett, C. H.; Burnes, A. H.; Burt, J. H.; Case, T. A.; Conrad, B. A.; Corcoran, M.; Crawford, B. C.; Dykstra, R. R.; Eagle, W. N.; Elder, Cecil; Fleming, Jas.; Gale, H. C.; Galley, F. W.; Gish, A. H.; Goss, L. W.; Hemphill, J. F.; Howell, L. A.; Imes, M.; Jungerman, G. F.; Kern, C. B.; Kinsley, C. C.; Kubin, E.; Kushner, A.; McCoy, J. E.; Makins, E. Jr.; Meyers, J. W.; McMurdo, C. D.; Murphy, B. W.; Mydland, G. H.; Potter, G. M.; Pyle, Chas. A.; Richards, L. T.; Richards, W. H.; Saunders, Chas.; Servatius, J. N.; Sihler, C. J.; Songer, L. C.; Thomas, J. F.; Truax, B. W.; Whiting, A. Homer; Wiseman, W.; Zecha, J. R.

Kentucky—Chisler, O. S.; Graham, R.; Miller, C. A.; Mussellman, S. F.; Purdy, M. A.; Schneider, F. O.; Thompson, L. E.

Louisiana—Dushong, J. P.; Dalrymple, W. H.; Douglass, F. J.; Drexler, J. L.; Kendrick, A. D.; Moore, Hamlet.

Maine—Robinson, W. H.

Maryland—Jarman, G. A.

Massachusetts—Cahill, E. A.; Hennessey, W. J.; Peirce, H. W.; Winchester, J. F.

Michigan—Brenton, S.; Brown, S.; Dunphy, G. W.; Giltner, W.; Hall, Maurice C.; Hallman, E. T.; Hoskins, H. Preston; Krey, T. F.; McGuire, C. S.; States, H. E.; Wurm, J. E.

Minnesota—Beebe, W. L.; Brimhall, S. D.; Cotton, C. E.; Donaldson, R. R.; Elmer, J. H.; Fitch, C. P.; Kartrude, E. H.; Leech, G. Ed.; Lyon, H. C.; McMillen, J. E.; Nelson, C. A.; Ward, S. H.

Mississippi—Beaver, J. A.; Gates, W. L.; Lewis, James; Ranck, E. M.

Missouri—Anderson, M. O.; Bourne, R. F.; Brainerd, E.; Brown, F. F.; Brown, Lyman D.; Butin, G. E.; Byrd, A.; Caldwell, F. W.; Carver, H. C.; Coughlin, J. G.; Courtright, J. M.; Croll, F. B.; Davidson, F. B.; Dodson, H. F.; Eisenhower, J. M.; Folse, C. D.; Francis, A. H.; Glover, A. D.; Graham, G. G.; Graham, Ralph; Hichman, Thomas S.; Holkenbrink, F. W.; Howells, Owen; Humphreys, J. C.; Jensen, H.; Kinsley, A. T.; LaCroix, J. V.; Lash, C. D.; Logan, E. A.; McDaniel, J. S.; McIntyre, G. W.; Malcolm, A. F.; Martin, W. L.; Moore, R. C.; Morgan, S. S.; Munn, A. J.; Nelson, C. L.; Nicholas, G. B.; Norden, C. J.; Noyes, O. W.; Oesterhaus, J. H.; Patterson, E. J.; Peck, S. A.; Ritter, P.; Rogers, B. R.; Shikles, E. A.; Silverford,

H. H.; Smith, L. C.; Smith, S.; Stewart, S.; Stewart, S. L.; Treadway, C. R.; Tricket, A.; Walch, C. I.; Welch, W. B.; White, C. M.; White, T. E.; Willyoung, L. E.

Montana—Knowles, A. D.; Mitchell, J. F.; Mock, C. E.

Nebraska—Anderson, J. S.; Casper, A. M.; Cosford, S. C.; Davidson, F. N.; Elliott, Chas.; Fisher, W. W.; Gain, J. H.; Gerber, J. N.; Grance, J. A.; Jones, W. F.; Juckniess, P.; Meenen, P. J.; Molgard, P. C.; Moore, B. A.; Neugebauer, E. J.; Newman, L. V.; Odell, Edwin; Perrin, Floyd; Peterson, E. D.; Prowett, H. L.; Salsbury, J. E.; Sandin, O.; Schaefer, G. L.; Schaefer, V.; Steel, E. R.; Turpen, I. C.; Weinman, J. E.; Wimsett, O. R.

Nevada—Records, Edw.

New Hampshire—Edmunds, A. L.; Swail, C. E.

New Jersey—Glennon, Jas. T.; Smith, Thos. E.; Steinbach, F. G.; Vliet, Geo. B.

New York—Amling, Henry; Birch, R. R.; Chase, Chas. S.; Cochran, David W.; DeVine, J. F.; Eichhorn, A.; Faust, Otto; Fish, P. A.; Frost, J. N.; Hagan, W. A.; Hayden, C. E.; Hoskins, W. H.; Knapp, G. A.; Kelly, W. H.; McKellar, R. S.; Moore, V. A.; Slawson, A.; Udall, D. H.; Webber, C. R.; Webber, L. R.; Williams, W. L.; Wills, J. G.

North Carolina—Kaupp, B. F.; Roberts, G. A.

North Dakota—Harris, E. D.

Ohio—Anderson, F. E.; Axby, W. A.; Beechy, L. P.; Bernath, R. J.; Blattenberg, J. H.; Case, C. H.; Cook, P. M.; Cooley, A. S.; Hilty, Reuben; Meyer, J. C.; Sheeran, H. D.; Shepard, E. H.

Oklahoma—Anthony, C. H.; Ayers, H. Wood; Bowerman, R. W.; Eagle, John; Gerber, D. W.; Jimmerson, J. H.; Lowell, J. A.; Meads, F. F.; Moore, F. T. S.; Nance, J. E.; Roscoe, H. A.; Shuler, W. P.; Vorba, J. M.

Oregon—Simms, B. T.

Pennsylvania—Althouse, E. P.; Cox, H. B.; Faivre, C. F.; Freed, B. M.; Hardenbergh, J. B.; Havner, H. H.; Hoskins, C. M.; Klein, Louis A.; Marshall, C. J.; Munce, T. E.; Reichel, J.; Schneider, F. H.; Stubbs, E. L.; Turner, H. W.; Wilson, I. D.; Wright, H. K.

Rhode Island—Armstrong, J. M.

South Dakota—Christiansen, J. C.; Dinwoodie, John; Eagle, T. J.; Edminston, G. A.

Tennessee—Bell, W. M.; Haynes, J. B.; Jacob, M.; Morgan, F. W.; Scheibler, J. W.

Texas—Barnes, F. E.; Bittick, S. G.; Brock, W. G.; Gossett, J. L.; Green, B. F.; Jarrel, E. F.; Pearce, D.; Marsteller, R. P.; Watson, T. W.; Wilkins, J. E.; Williams, N. F.

West Virginia—Hershey, S. E.; Holt, A. J.

Wyoming—French, A. W.

Wisconsin—Abbott, A. J.; Arzberger, W. W.; Eliason, O. H.; Ferguson, T. H.; Hadley, F. B.; Hart, L. G. W.; West, J. P.; Walkley, S. J.; Wright, L. A.

Canada—Barnes, R.; Grange, E. A. A.; Higgins, C. H.; Patton, W. T.; Torrance, F.

VISITORS

Arkansas—Stubbs, C. D.; Waddle, H. P.

California—Fleming, J. J.

Colorado—Richards, G. L.

Georgia—White, W. E.

Illinois—Aubuchon, F. P.; Busey, M. W.; Cozart, J. M.; Dunn, J. P.; Ferguson, John J.; Florine, G. G.; Gross, D. S.; Hapenney, James; Hogan, J. H.; Leib, H. W.; Libe, O. R.; Martin, W. J.; Moore, O.; Mark, Julius; Pilon, F. J.; Saxton, B. H.; Shaughenessy, C. P.; Shum, Z. C.; Thiry, J. P.; Whitten, M. P.; Utley, H. C.; Woods, P. O.

Indiana—Crosley, G. G.;Donelson, C. C.; White, G. H.; Wood, L. A.

Iowa—Austin, W. H.; Barber, B. F.; Barta, J. C.; Beaumont, L. C.; Bell, H. A.; Bolk, C. W.; Bosworth, C. E.; Brooks, B. H.; Brown, I. C.; Chapman, J. L.; Clay, C. C.; Conquist, A. M.; Craft, J. S.; Craik, A. L.; Cummings, W. P.; Diller, C. R.; East, C. J.; Finley, E. L.; Gillette; Gity, Geo.; Haston, S. S.; Hawthorne, G. A.; Heckard, C. J.; Hoeffeins, H. J.; Jensen, J. A.; Kaderabek, A.; Kelly, C. W.; Kilfoy, L. T.; Lee, F. M.; Lindsey, L. L.; Ludington, U. A.; McNamara, J. B.; Mallence, R.; Mallett, F. A.; Maxfield, F. N.; Menary, W. J.; Millgate, S. G.; Moore, J. J.; Nash, J. G.; Nelson, J. M.; Norden, W. E.; Samson, H. J.; Scott, L. P.; Schumaker, H. D.; Smith, W. A.; Steele, M. L.; Stromlund, E. V.; Stults, L. S.; Talbot, W. W.; Treman, A. J.; Weimer, F. D.; Wiley, C. W.; Wilhite, C. L.; Williams, J. F.; Wolfe, J.; Wood, L.

Kansas—Abel, G. C.; Abendshein, A.; Appleberry, E. T.; Atkinson. L. G.; Barns, A. H.; Boyd, W. H.; Brownlee, H.; Burchaw, D. H.; Burkett, O. R.; Burdick, A. P.; Bux, J. H.; Campbell, R. H.; Cuthbertson, A. A.; Dicke, E. L.; Dill, D. M.; Duffin, O. R.; Evans, A. C.; Farrington, A. M.; Foulk, R. C.; Gall, D. E.; Gentry, L. P.; Grimes, R. B.; Guilfoil, W. J.; Hadley, T. W.; Hammond, M. J.; Hann, J. E.; Harris, J. T.; Hayes, R. H.; Hilts, H.; Hobbs, C. W.; Hollicker, E. B.; Hough, C. A.; Howard, U. D.; Hurst, F. M.; Imler, F. A.; Jones, David, Kilian, E. H.; King, W. T.; Knapp, J. H.; Lawson, J. M.; Le May, D.; Little, E. W.; McCoppin, C. R.; McCrone, E. W.; McVaigh, F.; Maeder, S.; Magill, A. B.; Mooney, W. C.; Newlin, H. E.; Nickel, A.; Nickel, C. C.; Noller, O. W.; O'Connor, J. P.; Pyles, A. S.; Reed, L. J.; Rose, S. E.; Ross, W. G.; Rosetetter, G. A.; Ruhe, H. W.; Russell, R. N.; Russell, G. N.; Scott, J. P.; Selig, W. H.; Sente, W. H.; Shannon, J. V.; Shaw, G. C.; Shetler, A. A.; Smith, J. W.; Smith, W. A.; Smith, W. B.; Songer, W. G.; Stilley, L. E.; Strode, C. W.; Steele, E. H.; Talbot, S. P.; Tice, H. R.; Timmer, Joe; Wagner, C. L.; Wenpe, A. F.; Wharton, R. H.; Wimsett, J. G.; Young, J. O.; Zurkaw, M. L.

Louisiana—Barbee, A. V.; Walter, Martin L.

Massachusetts—Brackett, E. R.

Michigan—Cash, G. B.

Minnesota—Dodds, R. P.; Remington, D. J.; Ross, J. King; Wentworth, J. E.

Missouri—Aldridge, S. B.;Barbee, J. S.; Beauman, H. G.; Behney, J. E.; Bradley, H.; Bradley, N. W.; Calley, B. F.; Cary, E. J.; Chenowith, J. W.; Clausen, C. F. W.; Clement, C. B.; Connell, E. H.; Conrad, H. C.; Cornell,

W. A.; Craig, Wm.; Curry, Hugh; Curts, L. M.; Dappen, B. E.; Dorman, G. M.; Dudgeon, E. L.; Edwards, D. H.; Ester, A. W.; Etling, C. C.; Farley, M. A.; Faunce, A. L.; George, J. G.; George, J. W.; Gillett, J. L.; Gingery, J. B.; Gitz, C. F.; Glover, E. K.; Gloyd, R. R.; Goodlove, A.; Gouge, M. E.; Gould, O. S.; Graham, F. B.; Grant, G. A.; Graves, C. M.; Green. G. C.; Gregg, T. H.; Grinstead, O. D.; Hall, K. H.; Harrison, W.; Hauber, J. F.; Haver, C. V.; Heck, J. A.; Hendren, G. E.; Henning, C. E.; Hercheroeder, F.; Hufft, E. E.; Hughes, D. J.; James, A. W.; James, P. M.; Jones, J. L.; Johnson, J. L.; Jonker, H. H.; Kinsley, Albert Jr.; Kirby, O. W.; Kiser, B. L.; Kovar, Victor E.; Lauraine, L. J.; Lee, T. M.; Long, Glen; Luckey, D. F.; MacCartney, H. J.; McChesney, J. G.; McConnell, H. M.; McCormack, B.; McGuire, W. B.; Maxwell, G. E.; Meeks, R. B.; Meinershagen, B. H.; Middaugh, L. H.; Miller, I. N.; Miller, Karl; Morgan, D. B.; Morrow, A. E.; Moser, Geo. C.; Murphy, O. T.; Mutziger, F. J.; Naber, E. E.; Neil, W. E.; Norton, R.; Olson, O. C.; Osterholtz, W. F.; Patterson, L. M.; Patterson, W. E.; Pearson, J. R.; Peltier, L.; Phipps, W. H.; Picketts, T.; Pringle, W. R.; Ray, J. D.; Reed, C. H.; Reece, C. L.; Riley, J. W.; Ross, H. M.; Russell, H. B.; Ruth, E. C.; Sappington, M. A.; Schlegel, J. O.; Shartle, J. E.; Shikles, J. R.; Shrewsberry, H. D.; Sifford, Fred; Smiley, T. M.; Smith, Henry G.; Stephenson, J. B.; Stern, C. G.; Stewart, L. C.; Stone, W. E.; Stone, W. J.; Suets, H. F.; Sullivan, S. E.; Thomas, W. H.; Thomasson, J. E.; Thompson, L. F.; Tipton, Thomas B.; Townsend, G. F.; Underwood, C. S.; Vance, Owen; Vedder, S. Y.; Ward, R. M.; Warren, W.; Wells, M. C.; Wolfe, F. A.; Word, N. E.; Wright, J. B.; Wright, J. T.; Yates, J. W.; Young, E. L.

Nebraska—Alford, S. W.; Anderson, A. A.; Anderson, E. P.; Anderson, G. H.; Anderson, O. W.; Baldwin, F. A.; Barber, J. N.; Barnes, H. C.; Bell, F. W.; Brown, A. A.; Deuell, H. L.; Duff, D. R.; Eddingfield, A. A.; Feistner, H. L.; Gabler, R.; Gearhart, C. H.; Goodwin, Lyle; Guffey, J. P.; Huntley, R. A.; Klusmire, F. W.; Laird, C. M.; Lake, G. M.; Lenerts, G. H.; Miller, G. R.; Moffitt, G. W.; Newton, E. G.; Peebles, D. C.; Reed, F. L.; Reed, S. R.; Rister, L.; Rose, T. P.; Russell, E. Z.; Sceli, L. E.; Schmela, Jno.; Simonson, P.; Stryson, C. C.; Swim, B. H.; Tinkham, G. R.; Wastrick, C. S.; Williamson, R. N.; Witt, B.; Worley, E. R.; Young, A. G.

New Hampshire—Fuller, Clark.

New Jersey—Chapman, W. L.; Hayden, Frank.

New Mexico—Jones, G. M.; Kemper, H. E.; Troy, O. E.

New York—Krall, G. H.; Williams, W. W.

North Carolina—Cress, G. C.; Rollins, H. J.; Spoon, J. P.

Ohio—Howard, S. R.; Hughes, M. W.

Oklahoma—Bowerman, J. R.; Cherry, J. L.; Hiaschberg; Knoblock, C. C.; McConnell, W. C.; Mahaffy, Jas R.; Mohr, C. A.; Rader, W. S.; Robinson, O. E.; Steel, C. E.; Worsham, J. S.

Pennsylvania—Gery, Chas. G.; Reetenwald, N.

South Dakota—Bailey, J. M.; Brewster, L. P.; Quelland, J. D.

Texas—Adamson, G. V.; Jones, L. L.; Starr, P. P.; Wilson, J. C.; Wright, L. H.

Wisconsin—Jewel, Enoch; Tasche, L. C.
Wyoming—Anderson, G. D.
Canada—Olver, A.

NEW MEMBERS ELECTED AT THE KANSAS CITY MEETING OF THE A. V. M. A.

ALABAMA

Avant, Roy, D.V.M.....care Birmingham Packing Co., Birmingham
Bender, J. E., D.V.M.....1108 Jefferson Co. Savings Bank Bldg., Birmingham
Endsley, W. L., D.V.S.....1108 Jefferson Co. Bank Bldg., Birmingham
Faulk, Archie Lee, D.V.M.....Samson, Geneva Co.
French, A. H., M.D.C.....1427 Third Ave. N., Birmingham
Ingram, George Douglas. D.V.M.....Eutaw
Jackson, R. E.....1108 Jefferson Bank Bldg., Birmingham
Kamper, J. S., D.V.M.....Coatopa
Kearley, Richard T., D.V.M.....Andalusia
Klein, C. A.....P. O. Box 223, Andalusia
Leininger, Monroe H., D.V.S.....Clayton
Lent, Ernest E., D.V.M.....Goodwater
Minge, Benjamin Otey, B.Sc., M.D.V.
1108 Jefferson Co., Bank Bldg., Birmingham
Oldham, Jas. S., D.V.M.....Selma
Pellette, Dudley B., D.V.M.....Box 208, Talladega
Schimmel, Walter James .....7603 2nd Av., Birmingham
Woolf, Frank Perry, D.V.M.....Mobile
Workman, L. F., D.V.M.....Chatom

ARIZONA

Hight, R. J., M.D.C.....Tempe

ARKANSAS

Boxmeyer, Roy E., D.V.M.....State Serum Plant, Little Rock
Brouse, Stanley C.....Strong
Buffington, Leonard M., D.V.M...U. S. Bureau of Animal Industry, Little Rock
Burwell, L. W., D.V.M.....Clarendon
Caldwell, George L., D.V.M.....Agricultural Station, Fayetteville
Darby, Howard L.....312 Gazette Bldg., Little Rock
Driver, Fred C., D.V.M.....Danville
Gibson, Jonathan.....1222 W. 33d St., Little Rock
Gregory, Marvin.....312 Gazette Bldg., Little Rock
Gregory, R. A., D.V.S.....Forest City
Kelly, Ray, D.V.S.....Helena
Kittrell, Earl Linwood, D.V.M.....Augusta
Merchant, B. H., V.S.....714 Broadway St., Little Rock
Rathbun, C. F.....312 Gazette Bldg., Little Rock
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Palmer, Charles E., D.V.M. ..... Harrison
Petteys, Charles E., D.V.M. ..... 619 Walnut St., Toledo
Sheeran, H. D., M.D.V. ..... Fostoria
Sparhawk, Howard D. ..... Akron
Stockstill, W. D. ..... Sidney
Turner, Dr. Wm. ..... Amherst, Lorain Co.

OKLAHOMA

Anthony, Chas. H., D.V.S. ..... 2 E. 4th St., Oklahoma City
Aufente, John R., D.V.S. ..... Morris Pkg. Co., Govt. Office, Oklahoma City
Ayers, H. Wood ..... 1025 N. Lee St., Oklahoma City
Bowerman, R. U., D.V.S. ..... Hennesey
Bowman, Jno. M., D.V.M. ..... Box 91, Altus
Browne, L. D., D.V.S. ..... Guthrie
Chidester, O. D., D.V.S. ..... Cordell
Dumbauld, Harry, M.D.C. ..... 1833 West Park, Oklahoma City
Dietrich, LeRoy E., D.M.V. ..... Dewey, Box 612
Freeman, J. C., D.V.M. ..... Enid
Glenn, H. H., M.D.C. ..... 615 E. 17th St., Oklahoma City
Hall, Willis Franklin, D.V.M. ..... Holdenville
Hinckley, D. F. ..... Watonga
Hughes, Arthur O., D.V.S. ..... Mangum
Jimmerson, J. H. ..... Newkirk
Lowell, J. A. ..... Shawnee
Martin, Walter Hyde, D.V.M. ..... 318 S. Hoff Av., El Reno
McConnell, William Clarence, D.V.M. ..... Holdenville
Mohr, C. A. ..... Sapulpa
Moore, F. Y. S. ..... McAlester
Pilgrim, Ralph V., D.V.M. ..... Broken Arrow, Tulsa Co.
Rhoades, M. H. ..... 1101 W. 37th St., Oklahoma City
Robnet, Erin V., D.V.S. ..... 427 E. 7th St., Oklahoma City
Robinson, Osey E. ..... Bixby
Tittle, C. W., D. V. M. ..... Davis
Urba, J. M., M.D.V. ..... 805 W. Reno, Oklahoma City
Wilmot, Chas., D.V.M. ..... Chickasha
Wilmot, Dan., D.V.S. ..... Chickasha
Wilmot, John, D.V.S. ..... Chickasha

ONTARIO

Tamlin, C. S. ..... 453 Talbot St., London

OREGON

Masson, J. L., D.V.M. ..... Myrtle Point, Coos Co
Reedy, James Edward, D.V.M. ..... Tillamook

PENNSYLVANIA

Ainsworth, F. W., D.V.M. ..... 225 East Clay St., Lancaster
Barnard, H. W., V.M.D. ..... 529 E. King St., Lansaster
Boyd, Franklin Earl, V.M.D. .... Cor. 3rd and Walnut Sts., Columbia
Brady, H. B., M.V.D. ..... 242 N. Queen, Lancaster
Bushong, Geo. Lauer ..... 5839 Latona St., Philadelphia
Campbell, Walter E., V.M.D. ..... Berwyn Chester Co.
Chodos, Benjamin P., V.M.D. ..... Gap, Lancaster Co.
Craig, N. C., D.V.M. ..... 161 S. Wade Av., Washington
Donnelly, James Robert ..... 7239 Hermitage Av., Pittsburg
Donohue, M. E. Jr., V.M.D. ..... 28th and Thompson St., Philadelphia
Frush, C. W., D.V.M. ..... Belle Isle and W. Liberty Av., Pittsburg
Glass, Alexander, A.M., D.V.S. ..... 2321 Spruce St., Philadelphia
Greenlee, C. W., D.V.M. ..... 610 7th Av., Beaver Falls
Haigh, Henry H., V.M.D. ..... 3438 N. Broad St., Philadelphia
Havner, H. H., M.S., D.V.M. ..... State College
Hermann, John W. ..... Bureau of Animal Industry, Pittsburg

Kerr, John McCrookins.....New Kensington
Kingan, J. C.....4082 Liberty Av., Pittsburg
Kramer, W. C.....Jamestown
Leighton, Harry F.....503 Mills Av., Braddock
Lynn, William Monroe, D.V.M.....410 Fulton Bldg., Pittsburg
Maloney, M. J., V.M.D.....5423 Christian St., Philadelphia
McNeal, F, J., V.S.....28 N. State St., Wilkes-Barre
McNeal, P. N., V.S.....76 E. Market St., Wilkes-Barre
Milo, Howard A., V.M.D.....Union StockYards, Lancaster
Morgan, Warren B., V.M.S.....6728 Woodland Av., Philadelphia
Moyer, H. Clayton.....Blooming Glen, Bucks Co.
Pease, Harry S., D.V.M.....128 N. Central Av., Canonsburg
Pickup, Earl Spencer.....Union City
Reed, Ernest L., D.V.S.....Glenolden
Rosenberger, John N., V.M.D.....Wycombe
Ross, Lee F., D.V.M.....1242 Monterey St., Pittsburg
Sayre, Charles A., D.V.M.....1911 Howard St., Pittsburg
Schnell, Alvin William, V.M.D.....Wycombe, Bucks Co.
Sherrick, F. N., V.S.....224 E. Apple St., Connellsville
Siegmund, William C.....care Swift & Co., 7th and North St., Harrisburg
Timblin, Ward N.....Indiana
Tingley, E. K., V.M.D.....409 Elmwood Av., Glenolden
Turner, John H.....Wellsboro, Tioga Co.
Wilson, Gilbert A.....H. C. Frick Coke Co., Scottdale
Wilson, Irl D., D.V.M.....State College
Wood, Emlen.....Wayne

SOUTH DAKOTA

Calhoun, Harry L.....Irene
Dickey, Elvan S., D.V.S.....John Morrell & Co., Sioux Falls
Eagle, Thomas James, D.V.S.....1402 E. 7th St., Sioux Falls
Faber, George Garold, D.V.M.....112 1st Av. West, Mitchell
Harter, H. L., D.V.M.....Elk Point
Hunt, Clyde C., D.V.M.....J. Morrell & Co., Sioux Falls
Laird, W. R., D.V.M.....503 S. 2nd Av., Sioux Falls
Schneider, William G., D.V.M.....Gettysburg
Shabram, Jesse L., D.V.M.....Box 215, Hartford
Waite, Harrison N., D.V.M.....Corsica
Weldner, Morris Franklin, V.S.....Woonsocket
White, C. L., D.V.S.....411 N. Cliff Av., Sioux Falls
Wilbur, Bert Raymond, D.V.M.....P. O. Box 156, Sioux Falls

TENNESSEE

Haynes, Jas. B., D.V.M.....Gallatin

TEXAS

Brock, William G., V.S.....R. F. D. No. 11, Dallas
Cloud, Leon G., D.V.M.....108 Commerce St., Ft. Worth
Goodman, A. A.....Falfurrias
Gassett, John L., D.V.S.....McKinney
Jarrel, Everts F., M.D.C., D.V.S.....1821 Macy St., Ft. Worth
Middleton, Charles Calloway, D.V.M.....Remount No. 2, Fort Sam Houston
Starr, Perry P., D.V.S.....716 E. Cali., Gainesville
Stull, Charles M., D.V.S.....8th Cavalry, Fort Bliss
Watson, James Seely, M.D.C.....Mexia, Limestone Co.
Watters, S. A., D.V.S.....Kirbyville
Wiggs, Ernest M., D.V.M.....Greenville
Williams, Nicholas F., D.V.S.....909 Polk St., Amarillo

UTAH

Connelly, M. J.....Salt Lake City

VERMONT

Campbell, Wm., D.V.M. ..... Johnson, Lamoille Co.
Hamilton, William Arthur, D.V.M. ..... St. Johnsbury
Howes, Ben. ..... Island Pond

VIRGINIA

Gillespie, Andrew ..... British Remount Commission, New Port News
Hutton, A. G., D.V.M. ..... Lexington, Rockbridge Co.
Mahaffey, Jos. ..... Front Royal

WASHINGTON

Culbert, Robert W. ..... 220 Federal Bldg., Spokane
Donaghue, Joseph A. ..... Ritzville
Johnsen, Bernard, D.V.M. ..... W. 808 Dalton Av., Spokane
Pelton, L. Cleveland ..... 4533 14th Av. N. E., Seattle
Yates, George Herbert, M.D.C. ..... 1322 Aloha St., Seattle

WEST VIRGINIA

Bradley, O. C. ..... Wadestown
Cruse, Will, V.M.D. ..... Edgedale, Wheeling
Fisher, Shelley O., D.V.M. ..... R. F. D. No. 1, Liberty
Horton, I. W., M.D.C. ..... Moorefield
Kerr, William H., V.S. ..... Sistersville
Langford, W. E. ..... Martinsburg
Morgan, Rembrandt, D.V.M. ..... Winfield
Sponglers, E. M., D.V.S. ..... Norfolk
Young, J. P., D.V.S. ..... Leroy

WISCONSIN

Arzberger, Walter W., M.D.C. ..... 304 Madison St., Watertown
Boesewetter, Edward, D.V.S. ..... 711 Cedar St., West Bend, Washington Co.
Bussewitz, R. H., D.V.M. ..... Box 141, Milton Junction
Eastwold, J. D., D.V.M. ..... Independence
Fosche, L. C. ..... Sheboygan
Fulstow, Phil. H. ..... Camp Robinson, 2nd Lieut. V. O. R. C., Sparta
Gannan, R. A., M.D.C. ..... 814 Superior Av., Tomah
Hart, L. G. W. ..... Chippewa Falls
Meier, F. D., D.V.M. ..... 2821 Meinecke Av., Milwaukee
Rich, Warren H., D.V.M. ..... Mauston
Van De Sand, Chas. F. ..... Kiel

WYOMING

Martin, Harry Mathias, V.M.D. ..... University of Wyoming, Laramie

SUMMARY OF NEW MEMBERS

Alabama	17	Maine	1	Oklahoma	29
Arizona	1	Manitoba	2	Ontario	1
Arkansas	21	Maryland	2	Oregon	2
California	3	Massachusetts	4	Pennsylvania	42
Canal Zone	1	Michigan	12	South Dakota	13
Colorado	7	Minnesota	30	Tennessee	1
Connecticut	2	Missouri	21	Texas	12
District of Columbia	3	Mississippi	3	Vermont	3
Florida	1	Nebraska	19	Virginia	3
Georgia	3	Nevada	1	Washington	5
Idaho	2	New Jersey	2	West Virginia	9
Illinois	127	New Mexico	3	Wisconsin	11
Indiana	13	New York	1	Wyoming	1
Iowa	38	North Carolina	3		
Kansas	48	North Dakota	5	Total	556
Kentucky	11	Nova Scotia	1		
Louisiana	6	Ohio	10		

ASSOCIATION MEETINGS

CONNECTICUT VETERINARY MEDICAL ASSOCIATION

The summer meeting of the Connecticut Veterinary Medical Association was held at Lake Compounce in the Town of Bristol, Connecticut, on August eighth, 1917.

Twenty-four members and eight visitors were present. The beautiful surroundings and the delicious dinner served by the management of the resort tended to make everyone happy and congenial. The meeting was called to order at 3:00 P. M. in an open air theatre near the restaurant.

In answer to a communication from the Pennsylvania State Veterinary Medical Association, it was voted that the Connecticut V. M. A. endorse Philadelphia for the 1918 meeting of the A. V. M. A.

Following the business meeting, the President, G. W. Loveland, very ably acted as toastmaster. All of those upon whom Dr. Loveland called, responded with remarks, which, the discussions showed, to be very interesting to those present.

The first speaker, Mr. H. O. Averil, ex-commissioner on Domestic Animals, for the State of Connecticut, dwelt at some length upon his pleasant past associations with the members of the C. V. M. A. and laid stress upon the importance of co-operation between the office of the Commissioner on Domestic Animals and the practising veterinarians of the State. He spoke very highly of the present commissioner, Mr. James M. Whittlesey and said that he hoped the members would be as courteous to Mr. Whittlesey as they had been to him.

Mr. Whittlesey was the next speaker. He said that he was pleased to meet so many of the representative veterinarians of the State and that he hoped for their co-operation, advice and assistance. He said that in the work of eradication, which is the principal work of his office, he planned to employ the local practitioners as much as possible and to divide the work evenly among the reputable men and asked the members to bear in mind that the State is entitled to everyone's best service in these trying times. Relative to an act regarding the disposal of condemned animals, Mr. Whittlesey said that the animal should not be condemned until it has been appraised, and that the State will allow between ten and twenty-five dollars for a clinical case of glanders, but will pay more for a reactor. He said that it is desirable, whenever pos-

sible, in condemning cattle for tuberculosis to delay killing until this may be done in slaughter houses, under inspection, so as to conserve food and save money for the State, in other cases the animal may be sold to rendering companies and the amount thus received, paid to the owner and deducted from the amount to be paid by the comptroller.

The next speaker, Dr. C. L. Colton, Deputy Commissioner on Domestic Animals, said that there cannot be any hard and fast ruling as to the amount to be paid for a glandered horse, but that much more can be allowed for a reactor than for a clinical case. In relation to hog cholera work he said that the Commissioner controls all serum and virus in the State, as well as the administration of the same, saying that there is a certain method of applying the serum and virus, which it is well for us to adhere to. Dr. Colton said that there are, at present, five or six practitioners in the State who have become expert in hog cholera work. He said, "If your clients have hogs which they wish to have treated, the State will furnish papers to be filled out and the State will send an expert to demonstrate the work and you may do as much or as little as you like."

Dr. G. A. Knapp, of Millbrook, New York, spoke very interestingly of some practical experiences in unusual cases of glanders and tuberculosis.

Dr. Ben. D. Pierce of Springfield, Mass., spoke of the hog cholera work in Massachusetts, saying that all of the work is done by experts in the employ of the State and that the results are most gratifying. He said that it is his opinion that the work can be done much better in this way than by entrusting it to busy practitioners, it requires a great deal of time and thought and interferes with practice.

Dr. Balcomb of Massachusetts in speaking of chronic distemper in dogs, said that he obtained wonderful results from auto-inoculation. He takes the clean pus from the eye, mixes it with sterile water and injects it hypodermically.

The next meeting of the association will be held in Hartford on the first Tuesday in February, 1918.

A. T. Gilyard, Sec'y.

THE VERMONT VETERINARY MEDICAL ASSOCIATION

The semi-annual meeting of the Vermont Veterinary Medical Association was held at St. Johnsbury, July 25th and 26th, 1917. The meeting was called to order by President Thomas. The records of the present meeting were read and approved.

A new member, Chas. F. Hill, D.V.M., of Lancaster, N. H., was elected.

Dr. C. E. Swail read two short papers, one on Purpura, and the other on Septic Arthritis in Foals. The papers were very interesting and an interesting discussion followed and many helpful ideas were brought forward.

Dr. Guy N. Welch read an interesting paper on post parturient paresis, and some new features of this old infection in dairy cows was discussed.

On the morning of the 26th a clinic was held and some of the major operations were performed. Dr. E. H. Bancroft performed the roaring operation on an eight year old bay gelding, in standing position.

Dr. O. E. Barr performed the roaring operation on a twelve year old gelding in the recumbent position.

Several minor operations were performed, and the committee on local arrangements deserves credit for their work in getting so many interesting cases for the clinic. It was decided to hold the winter meeting at Burlington, Vt., January 16th and 17th, 1918.

GEO. STEPHENS, Sec. and Treas.

COMMUNICATIONS

COMMENTS ON DR. JAMES LAW'S ARTICLE

"ITEMS IN RECENT HISTORY OF VETERINARY MEDICINE"

Editor Journal of the American Veterinary Medical Association:
Ithaca, N. Y.

Dear Sir:—In this very interesting publication Dr. Law has attempted to review the more recent developments in the control of certain infectious diseases of animals. No doubt exceptions have been made to some of the statements contained in the article, since the methods suggested by Dr. Law are not by any means in accord with the views of the veterinary sanitarians of this country, as well as of others. It is not my intention to discuss the various features of his article, nor to enter into polemics on the various subjects taken up by Dr. Law; however. I cannot refrain from taking exception

to the gross misstatements which Dr. Law made relative to the simultaneous treatment of anthrax, in which I have been erroneously quoted.

On page 800 of the September issue of the *Journal* of the American Veterinary Medical Association, Dr. Law supposedly quoted from my work on "Experiments in Vaccinations against Anthrax", United States Department of Agriculture, *Bulletin No. 340*, as follows:

> "The simultaneous method is, as we have seen, but a makeshift. It is anything but a thorough, radical and permanent way of dealing with anthrax. In his recommendation of it, Dr. Eichhorn claims 'very favorable results' in many millions of animals treated by it. He, however, acknowledges that the product deteriorates very rapidly when kept under usual conditions, and that 'great losses have resulted from the application of inert vaccines'; that 'it requires two handlings before immunization is established'; that the 'losses from vaccination are not insignificant'; that 'standardization is often defective'; that 'its application in herds where the disease has already made its appearance is apt to induce the disease through the reduction of the resistance of the animal during the development of immunity', 'and should only be adopted in herds in which the disease has not yet appeared'."

It is regrettable that Dr. Law has erroneously misrepresented my statements which do not refer at all to the simultaneous method of treatment, but to the Pasteur method, and as a matter of fact throughout Dr. Law's article it appears that he confuses the Pasteur method with the simultaneous treatment.

The third paragraph, on page four of *Bulletin No. 340* from which Dr. Law made the above quotation reads as follows:

> "Other disadvantages of the Pasteur method which must be considered are, first, that it requires two handlings of the animals before immunity is established; second, that the losses from vaccinations are not insignificant; third, that its standardization is not carried out accurately; and fourth, that its administration in herds where the disease has already made its appearance is liable to induce the disease, through the reduction of the resistance of the animal during the process of vaccination, and for this last reason it is best adapted for use only with herds in which the disease has not yet appeared."

It is apparent that the statements which are quoted by Dr. Law are not in reference to the simultaneous method, but they

enumerate the disadvantages of the Pasteur method and surely that should have been noted by Dr. Law, especially since his high standing in the profession would naturally stamp his writings as accurate and reliable.

All these statements in the quotations made by Dr. Law on the simultaneous treatment were mentioned in my article as the short-comings of the Pasteur method and as a result of these short-comings the experimental work with the simultaneous treatment was undertaken in order to determine whether it would be possible to develop a method by which a safer and more prompt immunity might be produced.

The results obtained with the "simultaneous method", especially if an "attenuated spore vaccine" is being used in conjunction with the serum justify all the claims which have been made for this method of treatment, and the contentions of Dr. Law that the infection is being diffused by the vaccination is not in accord with the views of accepted authorities.

Dr. Law no doubt is well aware of the fact that the attenuated anthrax organism whether in the vegetative or in the spore form does not readily regain its original virulence. In fact all those who have been engaged in this line of work realize the difficulty of regaining the virulence of an attenuated organism even with passage through animals. Thus, if a No. 2 vaccine once loses its virulence, its passage through mice even for many generations will almost invariably fail to bring back its pathogenicity for guinea pigs. This characteristic of the attenuated vaccine has been recognized by many investigators and among those are Ascoli and R. Koch. The attenuated bacilli contained in the vaccine retain their cultural characteristics in the body of the vaccinated animal as well as their reduced virulence which cannot be increased even if passed through test animals.

If these findings of able investigators are given due credence the fears of Dr. Law of a continuous soil impregnation with anthrax bacilli from vaccination are unfounded, and furthermore from statistical data and personal observation, direct losses from vaccination with the simultaneous treatment are nil and this is to be considered one of the great advantages of the simultaneous treatment over the double vaccination.

I am very well pleased indeed that the exceptions which Dr. Law made were not directed against the value of the vaccination for prevention and controlling outbreaks of the disease, but were apparently made on account of his belief that following vaccination the germs are being diffused in the soil and such contentions, for the reasons stated above, cannot hold good.

With reference to Dr. Law's method of preventive treatment of anthrax as recommended by him, it is to my mind not in accord with the more recent advances made in immunology. It appears a

crude and futile procedure to draw blood from an animal sick with anthrax, boil the same in water for one hour, then add boiled water to the same in order to withdraw the soluble matter; strain it through cloth and inject the filtrate. From our advanced knowledge in biological therapy it would be hard to conceive how it would be possible by such a procedure to obtain an immunizing product. Those who are familiar with the pathogenesis of anthrax are well aware of the fact that blood of an infected animal may not contain the germs until very shortly before its death. If therefore, the blood is drawn from an animal in the last stages of the disease it will furnish a product which may be charged with organisms. If, on the other hand, it is taken from an animal just showing signs of the disease the blood would be more likely to be sterile. Yet the practitioner would have no means at his hand to determine the character of the blood which he is handling.

Furthermore, Dr. Law claims that by this procedure a sterile product is injected which contains only enzymes, toxins, etc. The investigations on anthrax have proven that toxin production is rather doubtful in this disease, and furthermore, it would be remarkable that enzymes and toxins would withstand one hour's boiling as recommended by Dr. Law. And last, but not least, while Dr. Law is emphatic in his stand against vaccination on account of the danger of creating new centers of infections, he recommends bleeding a sick animal, heating the blood and filtering it, which under conditions existing on a farm could not help but be a dangerous procedure not only to other animals, but also to human beings. The production of any biological product used for the control of anthrax should be strictly limited to laboratories on account of the great danger of handling the infected material.

I do not desire to discuss the sanitary side of the control of anthrax, but only intend to correct the erroneous statements of Dr. Law in justice to myself, and also I feel that a great wrong has been done to the pioneers of preventive medicine, especially Pasteur, Koch, Metchinkoff, Lorenze, Kolle, Jenner and others who laid the foundation for the wonderful work of vaccine therapy which has proven a blessing to mankind as well as to beasts.

A. EICHHORN, Pearl River, N. Y.

CATTLE TICKS AND THE GERMAN SUBMARINES

Editor Journal of the American Veterinary Medical Association:
Ithaca, N. Y.

Dear Sir:—The cattle tick is a friend of the German Kaiser, doing its bit to decrease our meat and milk supply.

These cattle ticks reduce milk yields from 18% to 42%, and decrease the beef production by causing death or stunted growth of its victims.

The German submarine is performing a like service for the

Kaiser, sinking supply ships that are carrying food to armies of the United States and her allies, thereby reducing the food supply.

The United States Congress, now in session, has recently passed a law entitled "An Act to provide further for the national security, and defense by encouraging the production, *conserving the supply*, and controlling the distribution of food products and fuel."

This law appropriates a sum of money for *Tick Eradication* in the interest of food production and conservation, thus making the getting rid of ticks a war measure.

Every stock raiser, large and small, should assist in the work of eradicating this cattle pest, so that ourselves and the armies of our allies may be supplied with more milk and meat food products.

J. B. REIDY, Inspector in Charge,
Houston, Texas.

NECROLOGY

G. A. O'NEIL

Dr. G. A. O'Neil died at his home at Savannah, N. Y., September 18 at the age of seventy years. Dr. O'Neil had been a resident of Savannah for the past twenty-five years. He is survived by three daughters and four sons.

MISCELLANEOUS

—Veterinarians will be welcome to the meeting and dinner of the Massachusetts V. M. A. at the Hotel Worthy, Springfield, Mass., Oct. 17.

—Dr. J. G. Rutherford, Superintendent of Agriculture and Animal Industry of the Department of Natural Resources of the Canadian Pacific Railway, has been elected president of the food committee for Alberta, the purpose of which is to have as much food as possible available for the allied armies, civilian populations of Great Britain and its allies and the civilian population of Canada.

—Dr. W. L. Hanson has resigned as Veterinary Inspector from the government service to engage in the practice of Veterinary Medicine at Greene, Ia.

—The marriage of Anna K. Glock of Louisville, Ky. to Dr. Ernest Clayton Goodrich of St. Joseph, Mich. occurred August 21. The "latch string is out" to A. V. M. A. members at 418 State St., St. Joseph, Mich.

—The marriage of Miss Esther Grace Lyon of Nickerson, Nebraska, to Dr. William A. Hagan, has been announced. They will be "at home" after October 1, at Ithaca, N. Y.

—Dr. E. A. Cahill has removed from Lowell to Winchester, Mass.